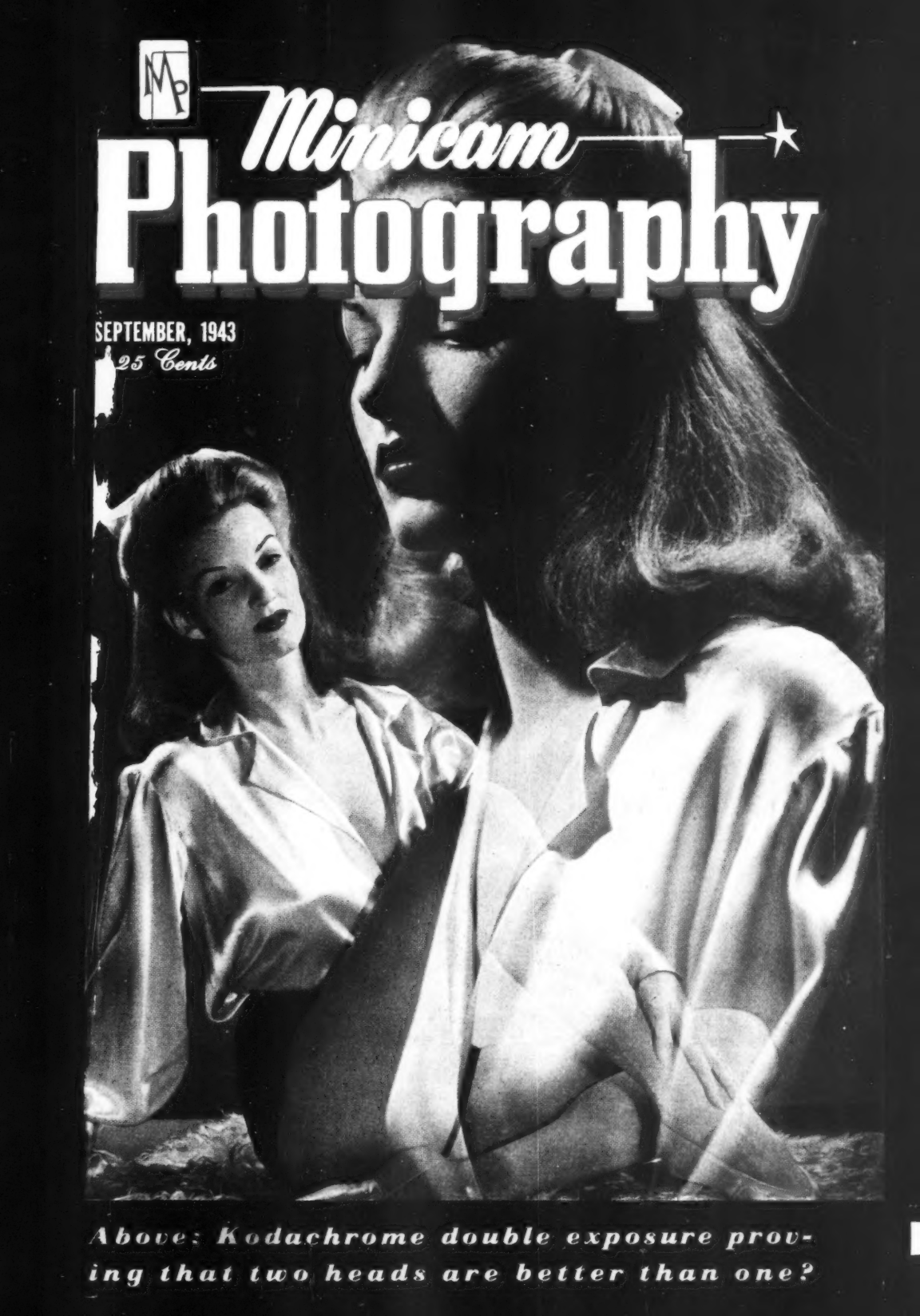

Above: Kodachrome double exposure proving that two heads are better than one?

"Good Pictures" bring you to him

1st. Lieut. Bernard Shaw, 28 year old son of Mrs. Veta Shaw, who is serving with the U. S. Army in the South Pacific.

Mrs. Veta Shaw, who kindly allows us to publish her son's letter, is helping him by working on the production front in our Optical Division.

Dear Mom and Mary:

Civilization has long been a dream to us, and when we look at a magazine or pictures from the good old U. S. A. it is like looking at Mars or some far-off, mythical place where all good soldiers go.

I'm not quite up on the local situation, I want to hear about Ann Arbor, Detroit, how people act, think, and what is going on. People at home have no idea how it is not to see a building, a church, a pretty girl for seven long months.

We are not ungrateful, it's just that we always want our World held up before us—it makes it easier to go on.

Love to all,
Bernard

Get the best out of your present camera, take care of it and get "Good Pictures." Pictorial records of your daily life will be of great interest to your men abroad. Send them pictures of the things they are fighting for. Here at Argus we are building steadily 100% War Production for Victory and preparing for that time, when our new cameras will replace those that are giving such good service today.

AWARDED TO PLANT 2
OPTICAL DIVISION

argus

INTERNATIONAL INDUSTRIES, INC.

ANN ARBOR MICHIGAN

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Learn how to use your present camera to get better results . . . learn about lenses, filters and exposure, conserve your film—make each picture a "good picture." Send 25c today for this 56 page book.

Straw in the wind

WHEN you want to catch it—catch it right—and catch it the first time . . . load up with Ansco Superpan Supreme and start shooting.

Advanced amateurs are using Superpan Supreme more and more. It is the ideal film for almost any subject, any time, under any conditions.

Here's why:

1. *High Speed*, which makes possible faster shutter action or smaller diaphragm openings.
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4. *Wide latitude* in exposure to compensate for minor errors in lens or shutter settings.
5. *Effective protection* against unsharpness due to halation.
6. *Protective surface coating* to minimize abrasions.

Although today's supply of Ansco Superpan Supreme is restricted, its uses and applications are unlimited. That's why it is the photographer's handiest standby—in sunlight or floodlight, in winter or summer, for still lifes or action shots. **Agfa Ansco, Binghamton, New York.**

Agfa Ansco

SUPERPAN SUPREME

KEEP YOUR EYE ON ANSCO—FIRST WITH THE FINEST

Minicam Photography

TABLE OF CONTENTS FOR SEPTEMBER, 1943

Articles

Departments

Cover by L. Willinger

Mr. Willinger, who is under contract to Metro-Goldwyn-Mayer, charged off this little photographic spree, with Model Laurie Douglas, to experimentation. It's The World's First Double Exposure Kodachrome Magazine Cover and will be worth one million dollars, eventually. Hang on to it and see for yourself. Mr. Willinger says: "Double exposure on kodachrome is done exactly as on black and white. There is of course, one difference: when two colors overlap, they will form a new color, combining the two basic colors. I used a 2A filter, f12, ½ sec."

Things to Come

'GLAMOUR AND HOW" is the step-by-step instructive story, with pictures, by Paul Garrison showing how to make the girl friend look like she wants to. "FUNDAMENTALS OF OPTICS" by Dr. I. Clyde Cornog, a lucid, comprehensive story of what you should know about light and sight. "PROCESS YOUR OWN MOVIE FILM" in which John Gafill tells exactly how to do it, with many illustrations and "HOW TO HELP THE WAR EFFORT WITH YOUR OWN PIX—text by various government agencies.

EDITORIAL ASSOCIATES: John Hutchins, A. R. P. S., George Platt Lynes, L. Moholy-Nagy, Audrey Goldsmith. **CONTRIBUTING EDITORS:** Charles S. Martz, F. R. P. S., Percival Wilde, A. R. P. S., Stuyvesant Peabody. **TECHNICAL EDITOR:** Ralph Haburton. **ART DIRECTOR:** Robert Wood. **BUSINESS MANAGER:** Aron M. Mathieu.

MINICAM PHOTOGRAPHY (TITLE REG. U. S. PAT. OFF.) PUBLISHED AT 22 E. 12th ST., CINCINNATI, O. PUBLISHED MONTHLY BY THE AUTOMOBILE DIGEST PUBLISHING CORP. YEARLY SUBSCRIPTION, $2.50 IN U. S. A. AND POSSESSIONS. CANADA AND COUNTRIES IN PAN-AMERICAN POSTAL UNION, $3.00. ELSEWHERE, $3.50. SINGLE COPIES, 25c. EASTERN ADVERTISING OFFICE: EVERETT GELLERT, 62 WEST 45th STREET, NEW YORK CITY. TELEPHONE VA. 6-5254. MID-WEST ADVERTISING OFFICE: BERNARD A. ROSENTHAL, 333 N. MICHIGAN, CHICAGO, ILL. TELEPHONE, FRANKLIN 7100. WEST COAST OFFICE: LOS ANGELES: 729 CHAPMAN BUILDING, 756 S. BROADWAY. R. H. DEIBLER. ENTERED AS SECOND CLASS MATTER AT CINCINNATI, OHIO, U. S. A., MARCH 21, 1938, UNDER THE ACT OF MARCH 3, 1879. PRINTED IN U. S. A.

HOW TO WHITTLE DOWN A WOLF PACK

FIRST STEP in sinking a sub is to *see* her. And if you don't see her *soon* enough, it may be the last sub you'll *ever* see.

First to last, sub hunting from the heaving deck of a freighter calls for precision teamwork by the gun crew, and for precision instruments. Particularly, precision *optical* instruments to help you see and sight your target.

Such instruments are required in unprecedented numbers for every operation in this war. To help meet this need, Universal is making them for the Army, Navy, Marines and the United Nations, in *quantity production* hitherto thought impossible where nothing but the finest will do.

Today, thanks largely to Universal engineering research, outstanding accuracy in lens-making is achieved more economically than ever before, *anywhere in the world.*

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Hold your hats, boys — it's only the beginning . . . *of your end.* The worst is yet to come.

Each succeeding day finds the dimes and dollars we, on the home front, put into U. S. WAR BONDS and STAMPS forging more and more of the weapons "they", on the fighting front, need. But — good as it is . . . we must do better. We've got to buy more and more BONDS — and keep on buying more and more. We've got to help shorten the war by getting behind the THIRD WAR BOND DRIVE — and "BACK THE ATTACK". We can and must with *our* fighting weapons — *at least 10% of our salaries — every week!*

Although KIN-O-LUX efforts are devoted to supplying the armed forces and many government agencies, you can still buy some KIN-O-LUX products at leading dealers everywhere.

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The Last Word

Camera Gun (For Professionals Only)

Sir:

I would appreciate receiving Capt. Prentice G. Morgan's address. He wrote the article *"Camera for Reconnaissance"* in your August issue of MINICAM PHOTOGRAPHY.

I am interested in the construction and details of his camera "gun," which, to my knowledge, is not covered in any army publication.

Thank you for this information.

H. B. CHILSON,
First Lt., U. S. Army.
12th Armored Division,
Camp Campbell, Ky.

• **Write to Capt. Prentice G. Morgan, Hq. IV Arm'd Corps, APO 354, Camp Young, California.**

The Grand Old Man

Sir:

I am sure that your magazine will prosper. There is a very live note running through it. And that is what I demand above all things from anything I come in contact with. Aliveness and a goodly dose of truthfulness, without a trace of sanctimoniousness in it. A life-giving smile—God's, not the Devil's grin. I don't know where to place the usual American Smile. I leave that to you. Maybe MINICAM can place it. If it can, please have it photographed and send me a print.

ALFRED STEIGLITZ,
New York City.

• **To any reader who can interpret the American smile in such a way as to please Alfred Stieglitz, we offer 1st $50, 2nd $25, 3rd $10. Send photos to us before November 15. If you want pic returned, enclose stamps.—ED.**

Sir:

The keyhole through which this mug shows is an old pal. Recognize him? It's Walter Winchell.

SGT. PAUL DORSEY,
U. S. Navy Hosp., Ward 47A,
Oakland, Calif.

GREAT MOMENTS in the Lives of Modern Photographers

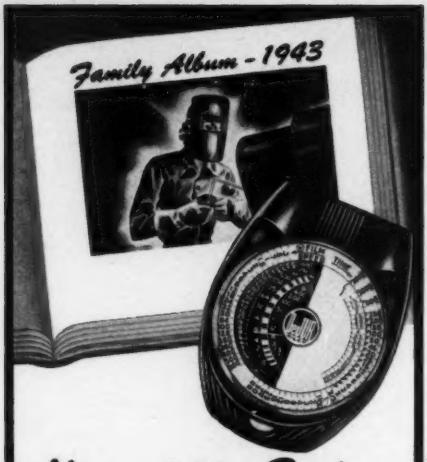
1. To the eagerly sought after graduates of New York's great cosmopolitan SCHOOL OF MODERN PHOTOGRAPHY come many signal opportunities. Typical is the great moment experienced by young Miss DENYSE SMITH. As photographer for Cartier's, swank Fifth Avenue jewelers of international repute, hers is a gem of an opportunity.. Says she, "I never thought I would be doing professional photography immediately upon graduation from the School."

2. In the Air Force you're "on the beam" when you're headed in the right direction. LAWRENCE A. ONISH *(right)* and WALTER A. WEYR *(below)*, both recent graduates of the School, are both very much "on the beam" as photographer - instructor and photographer, respectively, in Uncle Sam's Air Force. 94% of all School graduates in the armed forces are serving as photographers and photography instructors . . . hold ranks up to Major. An intensified course especially for young men approaching draft status may be started at any time.

3. No obstacle to ARTHUR AVEDON was his modest tuition fee while attending the SCHOOL OF MODERN PHOTOGRAPHY. Ably coached by those two virtuosi of portraiture, John Hutchins and Helene Sanders of the School's faculty, student Avedon was soon earning sufficient from free lance assignments to more than pay his way. He's moved along fast since graduation, is today chief photographer for Delar Studios, Radio City's top-flight portrait photographers.

4. Information Please! *"What about tuition fees?"* The answer is genuinely surprising, for specialized courses or complete study programs, either day or evening, are exceptionally moderate. Visit the School, or write for outline of courses. Address H. P. Sidel, director, Dept. M9.

THE SCHOOL OF MODERN PHOTOGRAPHY
136 East 57th St., New York City



Me and My Sunday-Monday-Tuesday Best

If I can't wield a weapon, I can at least weld one. And until the war is over, these overalls will be my favorite year 'round costume.

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Sorry, Our Error

Sir:

In your description of the parachuting Marine's sensations on page 66 of your July issue you say: "The blood rushes to his head as he plunges downward." Not as long as he is falling free, before the parachute opens. What will you bet?

D. M. DECKER,

1300 Harrison St.,
Wilmington, Del.

Sir:

Mr. Decker, the reader who calls your attention to the cutline on page 66 of your July issue, is entirely correct and the magazine is wrong when it states that "the blood rushes to his head as he plunges downward."

F. A. PETRIE,
Lieutenant, USNR,
Public Relations Officer.

U. S. Naval Air Station,
Lakehurst, N. J.

No, Sir, Friend—We Were Right First Time

Sir:

In the August issue of the MINICAM I believe there was a misstatement. In *"The Last Word"* Celia Joan Allen wrote inquiring what depth of focus was. You gave her the definition for depth of field. That is a common mistake but not one you should make.

We enjoy your magazine.

PFC. PRESTON L. CUNNINGHAM.

7th Photo Sqdn. (L),
Peterson Army Air Field,
Colorado Springs, Colo.

● For practical purposes, the terms "depth of field" and "depth of focus" usually are considered synonymous. They indicate the property possessed by a photographic lens of producing in one image or picture a sharp delineation of objects situated at different distances from the lens.

This property is inherent to a greater or less degree in all lenses: practically speaking, it is controlled by the focal length of the lens, its relative aperture, the distance of the lens from the groundglass or film, the diameter of the permissible circle of confusion, and the presence of aberrations or optical errors in the lens.

Strictly speaking, depth of field (also called "depth of definition") refers to the distance between the nearest and the farthest sharp object in the photograph, whereas depth of focus is that distance within which the focusing screen or photographic film may be moved while the object to be photographed remains stationary, and without the object suffering any material loss of sharpness during this movement.

In optical parlance, depth of focus represents the limits within which the film or screen can be moved without exceeding the circle of confusion or absolute focus of the pencils of light forming the image. The circle of confusion commonly is represented as a disk, the diameter of which is popularly assumed to be 1/200th of an inch.

OK, Pfc. Preston—now that you got in on the line, what are you going to do with it? We suggest this: If anybody asks you what depth of field, or depth of focus, or depth of definition means, you tell them: "THE DISTANCE BETWEEN THE NEAREST AND THE FARTHEST OBJECTS WHICH ARE SHARPLY REPRODUCED." If they squawk let them read the above, which is exact, dull, and preposterous to remember.—ED.

Scene from *Ride 'Em Cowboy* with Abbott and Costello. A Universal feature.

Eddie's on a ONE HOUR furlough

He's almost forgotten cramped, sweating hours inside the turret of his General Sherman . . . the ever-present pang of homesickness isn't *quite* so sharp when he can *laugh* . . . and he's laughing *now*, as the Filmosound pours out the fun and glamour of a Hollywood feature. He's *laughing*.

And Eddie's officers know the value of a soldier's laugh . . . and the worth of movies to provoke that laughter. That's why Filmosound Projectors are close to fighting men on almost every battle front . . . and in the Navy's fighting ships.

And back home in Army camps and Naval bases, untrained men study actual battle movies made with Filmo cameras. Movies teach millions how to outsmart and outfight a wily enemy . . . movies show the road to Victory.

This, then, is the single task of Bell & Howell . . . to produce the Filmo motion picture equipment and the special sighting devices that will in turn produce a war-smart, hard-hitting fighting force. And *every lesser* job will have to *wait!*

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*Opti-onics is the combined sciences of Optics and Electronics. Related and simultaneous research and engineering by Bell & Howell in these and in the mechanical sciences are giving important advantages to our fighting forces. Opti-onics will bring many new things to American living, after the war.

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"Thanks to N. Y. I. Training — One Picture Alone Paid Me $3,000.00"

Says N. Y. I. Graduate Victor De Palma.

Camera Ace Tells Why He Recommends N. Y. I. Course For Quick Success In Fascinating Profession.

"At N. Y. I. I learned by **doing**, with every step under the personal supervision of expert photographers. They were always there—full time—to give advice and instruction.

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"From then on assignments came at me with machine gun speed. Photography has made my life a thrilling and SUCCESSFUL experience, with an income far beyond my fondest hopes. I cannot thank New York Institute enough."

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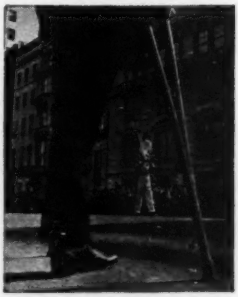

When will you be ready for success like that of Mr. De Palma and scores of other top-notch men and women photographers who took the first step to SUCCESS by enrolling at N. Y. I.? Or, if you are of military age, remember that over 500 N. Y. I. graduates are in U. S. Service—winning more pay, commissions, non-com and petty officer ratings, thanks to their N. Y. I. training. You can qualify through re ident or spare time home study instruc tion—INDIVIDUALIZED to YOUR needs, your time and your budget. Write today for beautiful FREE book, giving details of best-paying photo opportunities and N. Y. I. courses in Commercial, Advertising, News, Portrait, Motion Picture and Color Photography. Also special 7, 10 and 14-day resident courses now available. Mail the coupon now! NEW YORK INSTITUTE OF PHOTOGRAPHY, Dept. 117, 10 W. 33 St., New York 1, N. Y.

33rd YEAR

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We're for Elsie

Sir:

Salon exhibitor Stuyvesant Peabody voiced some excellent ideas in his article "Technique to Spare." One hears more and more murmurings of discontent concerning the prints hung in present day salons, and if those murmurings will only increase in volume we may someday achieve that revolution in pictorial photography which some of us, bored with the usual salon picture themes, would like to see.

As a salon committee worker, I see hundreds of prints which salon visitors never see. These prints should be far better than they are. American photographers, most of them, can do better. Instead of trying to interpret something which they see and feel, they try to imitate some print that the judges have passed in previous salons.

Naturally, not all the blame belongs on the photographer. The object in submitting prints is to have them accepted, so if the exhibitor sends only prints which he is fairly sure from experience will be accepted, he is only playing safe.

Running a salon is a lot of work. And when it is done by a club as small as our Fitchburg club, it is necessary that the salon shall meet all its expenses. What I should like to do is hold a salon next year where almost "anything goes." Our galleries are well adapted for hanging any size mount. And why rule out hand-colored prints if they can compete with the black and whites? I'd like to try the kind of jury that Mr. Peabody suggests. There would be fireworks, but it ought to be fun.

If you have any ideas on the possible financial success of such a salon, I'd be glad to hear them.

Your Mr. Gaston Van has asked what we think of limiting print entries to two and changing the fee to 50 cents a print. I'm in favor of keeping it at four prints for a dollar. Then if a photographer has three prints he's pretty hopeful of having accepted and has to pay a dollar anyway, he'll put in for his fourth a print that's a little out of the ususual, just for a feeler. Those are the prints which may change the complexion of salons.

Thank you for giving me the opportunity to put some of my scattered ideas into words.

ELSIE L. LOWE, *Chairman,*
Sixth Annual Salon of Photography.
Pearl Hill Road,
Fitchburg, Massachusetts.

A Good Man Behind an Argus "A" . . . .

Sir:

This is the time for MINICAM to go to town. I spent weeks getting a friend in Chicago 2 rolls of 127, in any damnemulsion whatever. A friend in Salt Lake City has threatened to sell his Zeiss Ikon because there isn't a 10x 15cm. plate of FP for miles around. When you ask for 120, they shake their heads, sadly. But you can still get 35mm. Confidentially, I just added 100 feet of Dupont II to my backlog yesterday. A month or two ago, I caged 55 feet of Ultraspeed Pan. For copying jobs, most of them, positive stock is good, and it's

AN INCREDIBLE number of "things" go into the making of a successful bombing mission. Among those the eye can see are fighter planes used to "eliminate" enemy interceptors. Playing their part, too, and no less important are many things the eye cannot see. For instance, the photographic chemicals used in the processing of reconnaissance pictures—particularly in the tropics under all conditions. Vital information for the day's actions depends on the clarity and accuracy with which details are revealed.

Fink-Roselieve is proud to be compounding and packing these "chemical bombsights" for the U. S. Army Air Force as part of an overall F-R production serving the U. S. Signal Corp., U. S. Medical Corp., U. S. Navy and U. S. Marines as well as essential industry on priority order.

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KEEP ON BUYING U. S. WAR BONDS AND STAMPS

easy to get, $1.25 for 100 feet and few takers. Saves the slow pan. And if you are in a real pinch for picnic pix, you can load up with positive color blind—everybody used stuff like that in 1912—and snap away at Weston 10, provided your subjects aren't badly freckled.

It does pretty well for colored copy, believe it or not. The minicam owner today is sitting on the world. He can get film where no one else can. It is high time that some genius debunked the silly notion that any minicam that didn't cost at least $100, is useless.

A good man behind an Argus "A" can make a chump of a medium guy with a Contax. It's time someone opened up about infra-red, a 35mm. drug on the market. Use it without a filter, for mill run outdoor snapping, it's a lot better than the "speed film" which, years ago, was the last word in sensitivity. And if you're technically inclined, get some Hollywood studio ends of Eastman Pan "K" and experiment. It'll amaze you how it works with copying, floral close ups, etc. without a filter. If you want to photograph the text of a sealed letter—I've done it—get some Infra-Red 35mm. Hell, mister, in times like this, the 35mm. owner has the world by the tail, and on a downhill pull!

E. Hoffman Price

Redwood City, Calif.

Photo Market

Sir:

I believe that an insertion of the following information in your next issue would be mutually helpful.

Look Magazine welcomes picture contributions from both amateur and professional photographers. Pictures should be of good quality, at least 4x5 in size, and accompanied by a fully explanatory letter or caption. Virtually any subject is appropriate, provided it has wide general interest and appeal. Payment, upon acceptance, averages five dollars for Reader's Page contributions, ten dollars and up for other photographs. Pictures will be returned only if accompanied by return postage and full name and address of sender.

Homer A. Cable, ...
Picture Editor, *Look* Magazine.
511 Fifth Ave.,
New York, N. Y.

An Idea Behind Every Picture?

Sir:

Mr. Peabody's statement that all people who are interested in photography have an interest in salons is assuming too much. Many excellent photographers I know have no interest in that sort of photographic foot-race.

His insistence of an *idea* behind every picture seems to prohibit the presentation of the beauty, per se, of texture, pattern and light, of subject matter which has been the motivating interest of many of the best photographers and artists of our century.

E. F. Wahlstrom

208 No. Doheny Drive,
Beverly Hills, California.

(*Continued on page* 72)

ANOTHER PRODUCT OF

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THIS is the Leitz Electro-Titrator . . . not a photographic accessory, but a laboratory instrument of invaluable aid to chemists in war work. The Electro-Titrator permits the chemist to quickly and accurately determine the completion of certain chemical reactions by measuring minute electrical currents.

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(*Note: Literature on Electro-Titrator available to those interested.*)

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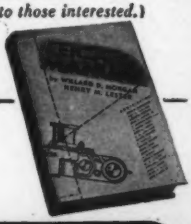

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ILEX LOOKS TO POST-WAR PHOTOGRAPHY

Newspapers, magazines and news-reels dramatize the importance of war-time photography. Photographic reconnaissance and interpretation . . . to locate enemy installations, troop movements, ship positions, and to determine bombing results . . . provide a major share of military intelligence today.

In all theatres of war, Ilex shutters, lenses and precision instruments are in action. For, Ilex is concentrating its skill, precision and facilities in 100% war production.

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Ilex Optical Co., Rochester, New York

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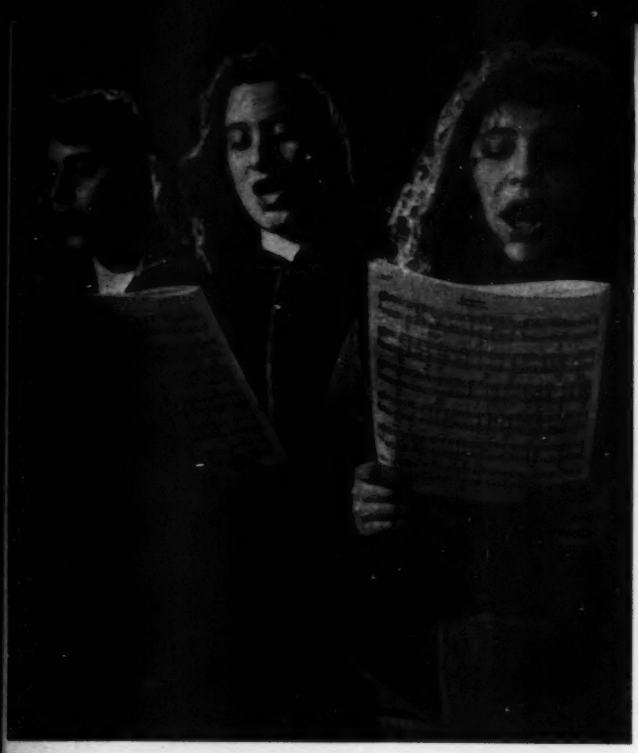


ONLY I

AMERICANS MAY CHERISH DIFFERENCES AND BENEFIT FROM THEM BECAUSE ONLY WHERE DIFFERENCES CAN EXIST WITHOUT PERSECUTION CAN THERE BE REAL FREEDOM

ARMENIAN Americans enjoy well deserved praise for their beautiful voices. Attired in red velvet robes and mantles of delicate lace their choirs are good to look upon as well as to hear.

PHOTOS BY ALEXANDER ALLAND
FROM "AMERICAN COUNTERPOINT"

By PEARL S. BUCK

LET us now remember afresh why our country was ever made. It was made for freedom's sake, that here all men might live together in peace and mutual allowance for each other's being. America is not a melting pot. It never was a melting pot nor will it ever be. It has been futile to try to weld us into a people of one mold. No, America is a country, where if it is to be America, men and women, believing in freedom, can live together in the common determination to let differences exist, to cherish differences and benefit from them, because only where differences can exist without persecution can there be real freedom.

In these pictures you will find a record of some of these differences. Here we are, living our daily lives, doing our work. None of us looks like the other—we look like our ancestors who brought us here in their own bodies and brains. Let us examine ourselves in these pictures, our faces, our shapes, the work which we do, the pleasure we take. You see that beauty belongs to us all and ugliness, too, and that what we have in common is only the freedom to be just what we are, so different from each other, and yet all American. The man who took these pictures was born in Russia, but he is an American, and he is showing you America through his camera. He has understood that to find America you have to look into many faces of many colors and kinds. This man has found an even greater variety in our country than most of them knew existed—Assyrian and Welsh, as well as English and German and Scandinavian, Italian and French. But try the test of Americanism—speak the word *freedom* to any of them and the same look comes into their eyes.

If freedom's light be darkened, then how great is that darkness!

I AMERICA

HERE is a man, and God bless him, enjoying himself. He is a Turkish American, joining with his friends in a benefit for the American Red Cross.

ABOUT 10,000 Indians live in America, mostly in Michigan, New York and California. Hindus and Moslems predominate. Their American born youngsters sing "America The Beautiful" with the same reverence as their schoolmates.

A DESCENDANT of the oldest American—a Mohawk woman, in her New York City apartment. American Indians relinquish their special privileges as wards of the nation, when they live off reservations.

MOSLEMS, of all other religious groups, are the most reluctant to be photographed at prayer. Because they were sure of my intentions and that the pictures will be used only for the purpose of promoting better understanding among all Americans that I was invited to record in a series of photographs, their manner of worship.

★ Notes by the Photographer Alexander Alland

WITH a few exceptions, my photographs of these American groups were taken indoors. Trying to avoid the self-restraint which people usually feel before a camera, I photographed them in familiar surroundings, and only after we were completely at ease with each other. While I found it necessary to arrange some of the subjects to dramatize a point, all photographs were taken in action, during the re-arranging.

After the subject matter, lighting was my biggest concern. To obtain action shots the lights had to be intense to allow for the required depth of field and the speed of action. So I had to resort to the use of flash bulbs—the kind of concentrated lighting that never does justice to our features. If in a dark hall, you have seen at close range the face of a speaker with a spotlight turned on him, you will understand what I mean. To offset that effect I use a few sources of light of varied intensity which I arrange at required angles and distances. In that way the balance of lights and shadows is maintained, giving an illusion of three dimensional structure to a subject on the flat surface of a print. I never use less than two sources of light, and often three or more, screening the bulbs with a cloth to reduce the intensity, when working in limited space.

IN FLEMISH caps and paisley shawls, Belgian American women meet to observe old customs.

All photographs were taken with a 3¼x 4¼ Linhof Camera, fitted with a range-finder coupled with a Protar lens of 6″ focal length. I found this lens best suited to average conditions. The lenses of shorter foci destroy the feeling of proper space-relationship between the subjects situated in different planes of vision, causing an exaggerated perspective. Of course none of the lenses are free from this phenomenon when the distance between the lens and the subjects are beyond control. For action photography I use panchromatic films of the highest sensitivity I can find, and process them in E.K. D-76 developer at 68 degrees Fahrenheit.

To maintain highlight-and-shadow detail it is imperative to co-ordinate exposure and development of the film. In flashlight photography this is more important than ever. I prefer full exposure and short development. The contrast can always be increased by using the proper grade of emulsion in the printing paper.

Undoubtedly, after the war we will witness tremendous improvements in photographic equipment and technique. Though unavailable to civilians for the duration, lenses made of glass of an entirely new composition are already in use. With greater ability to bend the light rays, this glass allows for less curvature of lens surfaces which results in better definition of image at larger apertures. Together with new emulsions of speeds undreamed of, we will be able to choose our lighting for speed photography with greater freedom.

But, no matter how great the improve-

(Photographer's notes concluded on page 98. Additional pictures on the following pages.)

Thirty years ago these Americans came to Ellis Island

PHOTOGRAPHY was the hobby of A. F. Sherman, chief clerk of Ellis Island. He photographed people as they came from the four corners of the earth, many in their native costume as their holiday best, their faces revealing the fears and hopes experienced on the threshhold of a new land. Mr. Sherman died 15 years ago and only 35 plates of his entire collection are left. Alexander Alland photographed these fading prints, bringing three of them vibrantly back to life.

SWEDISH

DUTCH

NORWEGIAN

DUTCH, Swede, and Norwegian—three of the countless countries whose young came here to grow up as Americans, and, as perhaps the young men on the picture have done, to die for America. Our mighty conviction grows for freedom. For the right for differences to exist, men will give all they have.

AMERICA IMPOSES its will, and change comes to this Portuguese family, even as it has come to the young people on the opposite page.

DARKROOM FOR A GYPSY

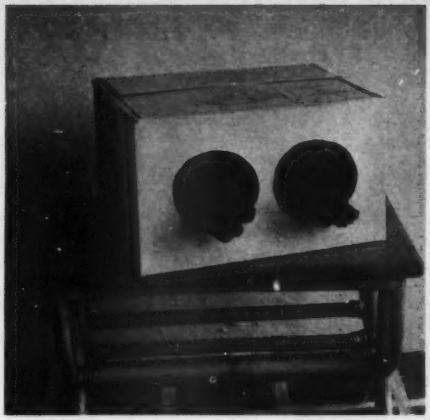
By AUGUST BRUHN

THESE TWO PICTURES were developed and fixed in daylight in the miniature darkroom. By evening the negatives were dry and the enlargements were made.

EVERY OPERATION, barring only enlarging, can be performed in a homemade Gypsy darkroom. Changing bags are suitable for loading film holders, cartridges and dry developing tanks; but it is often desirable to have additional equipment at hand, such as extra plate holders, extra unassembled film cartridges, or winding devices. The use of scissors would be a great hazard.

A Gypsy darkroom can be used for tray or tank development by the time and temperature method, loading cut-film holders, transferring 35mm. bulk film to cartridges, or, in an emergency, even for contact printing by the "guess and pray" method.

The materials required are two cardboard grocery cases and material for two light-proof sleeves. One box should be a little smaller than the other and have its flaps removed. Cut two holes in each case about six inches in diameter (children under ten are admitted through a four-inch armhole), being careful to measure beforehand so that the holes in both cases will coincide. Placing the smaller box upside down in the larger will prevent light from leaking through the cover flaps The black cloth sleeves should be of double thickness and cut about six and one-half inches in diameter. Each layer should be sewn separately and have two rubber bands placed an inch apart at the wrists to insure a light-tight fit. The sleeves may be sewn or cemented inside the holes of the outer box. Be sure that there are no light leaks. This may be tested by leaving a piece of sensitized paper, with one end covered, inside the box for about five minutes. If after developing, both ends are still white, it may be assumed that the box is light tight.



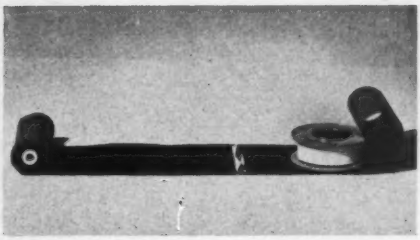
DARK ROOM from cardboard grocery box.

INNER BOX insures darkness.

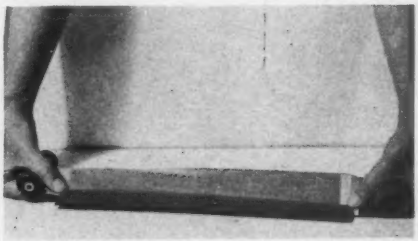
When developing cut-film or film pack, place the trays of chemicals inside the larger box; on them place a sheet of heavy cardboard to act as a table, while unloading the holders. A towel laid alongside of the trays may prove helpful. After all of the required equipment is in the larger box, insert the smaller one upside down and close the flaps of the outer box.

When handling undeveloped film in bright sunlight it is advisable to throw a black cloth over the miniature darkroom and tuck it under, leaving a space for the arms to enter the sleeves.

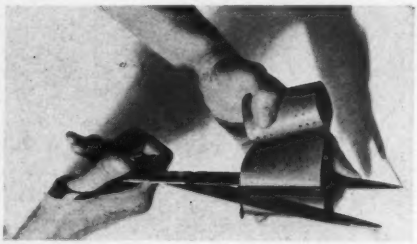
BEAT THE FILM SHORTAGE



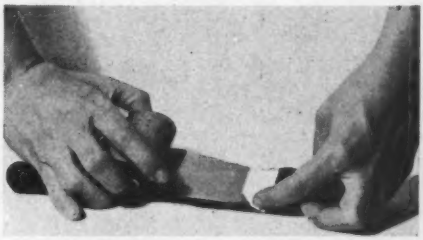
(1.) MAKE two rolls of film from one and avoid shooting the last few pix "just to finish the roll". Cut a strip of adhesive or gummed tape slightly shorter than the width of the paper, fold lengthwise and attach to inside of backing paper where original film was attached.



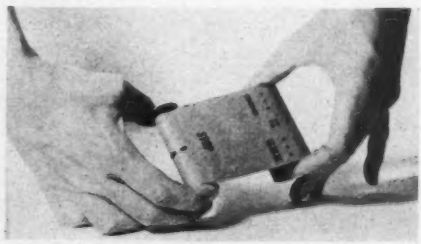
(2.) GO INTO darkroom, cut length from unexposed film with aid of a cutting guide. Measure from start of film, not start of backing paper. If working with fast pan film be sure all lights are out, but if using Ortho, a small red safelight is O. K.



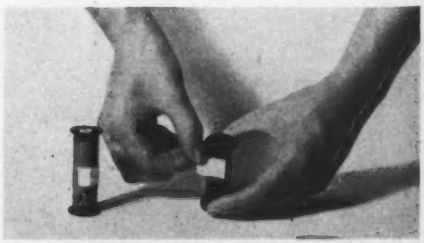
(3.) CUT FILM straight across at proper point, but don't cut paper. Handle film by edges.



(4.) ATTACH FILM to previously prepared backing paper by folding down the tape.



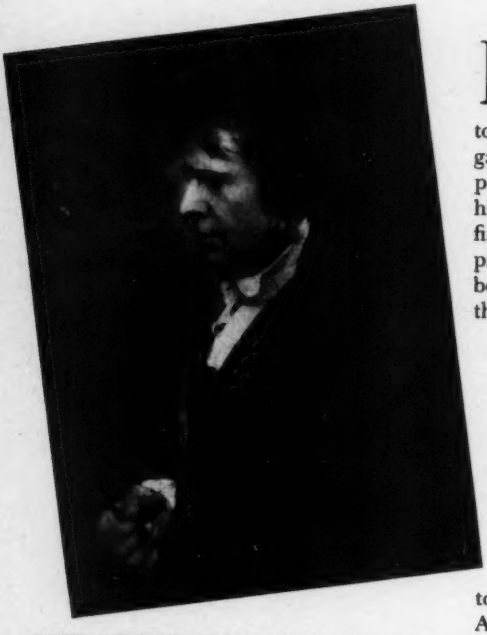
(5.) REWIND each roll tightly, but do not "cinch," as it will scratch the film.



(6.) FASTEN each roll with tape and mark number of exposures contained.

DAVID OCTAVIUS HILL *was the*

By ARON M. MATHIEU.... HILL PORTRAITS FROM "CAMERA WORK"



DAVID OCTAVIUS HILL made the photographs shown on these pages with the "Talbotype process" (described in MINICAM for July) in 1843-47. Talbot's two great basic discoveries were improved upon by Robert Adamson, Hill's assistant who also took the above photograph of Hill. These pictures were made from Hill's original paper negatives by Craig Annan, whose father, T. Annan, was his friend and countryman.

This is the second of a series of articles acquainting readers with their photographic cultural heritage. The first article, in July, dealt with William Henry Fox Talbot. The third article, forthcoming in either October or November issue is about Scott Archer, prepared by A. E. Marshall.

PHOTOGRAPHY was only four years old when its first great practioner, David Octavius Hill, began to produce calotypes which still are regarded as the best the world knows in portraiture. By studying his methods and his prints, we may fix in our minds the first principles of photography. As these principles become a natural part of our being and we use them correctly without thinking, and equally spontaneously reject the inartistic approach, we leave our days of amateurism behind and become a little less uncertain that our negative will show what the camera saw.

These first principles, singularly enough, deal with neither tools nor technique. Shakespeare got along nicely without a typewriter, sticking to the quill and foolscap. Hill, photographically speaking, had little better. A dollar Brownie with some pan film is a century better than anything Hill ever had; and a Contax with a F:1.5 lens, coupled range finder, built-in light meter 1/1250 of a second speed could have confused him just as much as it does so many of us today.

He had no artificial lights, filters, or calibrated charts, and his pictures were born where every picture should be born —in the mind and the heart of the man who takes it.

FASHIONS AND FADS in photography will come and go, but we feel convinced that Hill's work, made over a hundred years ago, in the days when photography was a laborious feat, establishes a standard of taste and style.

first portrait photographer

Hill's studio was really outdoors and his light came both from the sun overhead and also as it was cast up into the subject's face by a large concave mirror. Some qualities, inherent in hundreds of Hill's prints, are not necessarily qualities of artistic selection, but rather qualities forced on the photographer as the only means of mastering his problems. Most of his sitters were taken with slightly downcast eyes,—usually turned away from the photographer, because they sat out in the sun. To look straight ahead would make them squint, while the long 60 second exposure would blur the eye if the lids winked, or the eye moved. Hill, taking the easy way out, instructed most of his sitters to look down. The end result isn't necessarily a preferred one but certainly it turns out better than the hundred million odd snap shots taken annually of Aunt Betty on the front porch with her eyes all screwed up and her cheeks puffed into pouches because "the sun was in her eyes when the picture was taken."

So here, at the very start we run into a "first principle." Simply that there is no "must" which compels you, when taking the picture of a friend, to show each and every scar and blemish, character line and unshaven whisker. The prime quality of your photograph is not whether you instantly recognize the subject and his degree of fastidiousness the moment the picture was taken. Rather, the prime quality is whether or not the photograph as a whole is pleasing to the human eye which so delightedly responds to the balance and beauty of line.

Hill solved this matter, as he solved many others, in the simplest way; not perhaps the best, nor the most original, but certainly the simplest. Originally an artist, a not too successful one, Hill's study of art has brought him under the influence of the respected painters of his day, Raeburn, Ingres, Gainsborough, and Lawrence.

He loved the work of these men, and respected their artistic judgment as they transferred it to canvas. Thus, as a common denominator in many of Hill's photographs we see a likeness in composition, in arrangement, to the paintings of Raeburn, as for instance in his "Lord Eldin," or "Dr. Adam."

Unquestionably, the physical quality that gave Hill's portraits their special quality of composition was his own acquaintance with the cultural artistic heritage of his day. For us to copy this quality would be fraudulent, for we live in another day. Cèzanne, Renoir, Gauguin, Seurat, Manet, Monet,—the whole gamut of the French revolution in art is in our very blood. Whether or not we have seen a Renoir we have been influenced, unconsciously in our artistic thinking by billboard art, car card posters such as the Wrigley series, which in hand-me-down style have shoved at us all the artistic heritage of our day. Even the buttons on women's dresses, as compared to the style of Hill's day, show the influence of the fact that men like Picasso have lived. To copy the composition of a Hill portrait, so as to improve our own, is meritorious if we do it as an end result. But to copy Hill, as slavishly as possible, and make a few portraits after his style, is fun and interesting to do. The editors of MINICAM, for instance, did it just to hell around. I think we learn a little that way, but the essence that Hill's composition teaches us is to go right straight back to art leaders of this, our very own day, and look to them, not necessarily to Ingres and Raeburn, for inspiration in composition.

It is right here, where we do part company with many of our betters. They suggest, that the photographer go merely inside himself to discover the compositional form of his portraits. That's OK if you are "one in a million." But who of us is that one? We want to sing—we haven't the voice—we want to dance—we haven't the grace. For us who love photography as a hobby, who give it our spare time when we can, there is a comfortable, if not too original road. Like Hill, we may acquaint ourselves with the compositional forms of our day, and utilize ecclectically

GROUP PORTRAIT By David O. Hill

these newer, more modern forms. While it won't give us a great portrait, it surely will make Aunt Betty look one heck of a lot better as she stands there on the front porch.

In addition to composition, patterned after the art of his day, and the honest presumption of making his poses quite frankly suit the photographic material with which he worked, Hill established between himself and his subject a mood which is the quintessence of his art. This establishing of a mood, between the photographer and his human subject is within the realm of us all. Elsewhere in this issue, in a sort of a bastard way, Margaret Hawkins tells how she did it with a neighbor girl.

Exercises to teach us how to establish this mood, either by creating it in ourselves and endowing it to the sitter by force of personality; or by locating a very special charm in the sitter and capitalizing on it, are useful things to practise.

Hill himself may have tried the same, some afternoon, with a local fishwife. But in the portraits he left us, we see this fishwife not as a lovely piece of composition alone, but also as a fishwife of a particular village of Scotland, at a very special time in the day and year of Our Lord. And is that not the singular contribution of William Henry Fox Talbot's pencil of nature?

A technique Hill frequently used, perhaps to put the subject at ease, and also to help suggest the spirit and make-up of the subject to the viewer, was simply that of placing in the subjects hands some object connected with his trade or profession.

Studying Hill's pictures themselves is perhaps the best way to learn what the man has to offer us today.

Students of photograph's history may prefer some facts about Hill's life. He was born in 1802 at Perth, Scotland, and educated in Edinburgh where he spent almost

BECOMING more interested in Hill, after studying his life and work, the editors of MINICAM tried to make a picture after the manner of "D. O." The model read a passage from the book she holds, and then looked up, to interpret it. Taken out of doors with a concave mirror for extra lighting, to the model's left. (A small mirror won't do, as it causes spots.) The model, Ida Masini, is our editorial secretary. The photograph was made by Audrey Goldsmith of MINICAM's staff, "after the manner of 'D. O.' and just for the hell of it."

WILLIAM HENNING and Alexander Handyside Ritchie, both sculptors of prominence in Edinburgh around 1840. By D. O. Hill.

all his life. His father was a bookseller, and gave the boy a good education under Andrew Wilson, superintendent of the School of Art at Edinburgh. "D. O.," as he was called by his friends, turned to landscape painting, and one day, fortuitous circumstances, knocked the door down. In 1843 he received a commission to paint a group portrait of nearly 500 clergymen and laymen who in violent protest gathered in Edinburgh to found the Free Church of Scotland. Hill turned to photography to record the faces of these clergymen, so that he could then paint them at his leisure, enlisting the aid of Robert Adamson, a young chemist to help in developing and printing. The finished canvas with 470 faces is titled "The Signing of the Deed of Demission and Act of Separation" and as a work of art it is the inartistic monster you might expect. For it, however, Hill received 1,500 pounds plus the right to sell autotype copies of his own. The original painting measures 11 feet and 4 inches by 5 feet.

Hill's camera was a simple wooden box. The (English) *Photographic Journal* has said: "we would not give candy for his lens." The shutter was opened and closed by a lever. Exposures were in full sunlight from 30 seconds to one minute. The lens was a short focus achromatic. For negatives, Hill used what Talbot invented, as described in MINICAM for July, '43. However, he soaked his paper in wax so the light passed through them easier. His positives were printed on silver chloride paper and fixed with hypo-sulphite of soda.

All of Hill's portraits seem to have a natural look, as if he had slipped up and caught the subject at work in a pensive moment. For instance, James Nasmyth, an engineer, was sitting holding a divider and a book, perhaps figuring out a mathematical problem; while Alexander Handyside Ritchie, a sculptor, holds a modeling tool, leaning back as though studying, before putting on the finishing touches. Hill's subjects, being mostly notables, had expressive faces filled with character. Today photographers will often strive to record a face with definition that would delight an optician, and forget a man's character and his life's work.

Hill concentrated most of his attention on the head and the hands of his subjects as conveyors of spiritual meanings. Sometimes he singled out small details of dress and ornament to increase the opulent effect of a particular picture or to emphasize, as Alan Graeme said, "the total physical unity of the subject."

The outstanding authority on David O. Hill is Dr. Heinrich Schwarz, formerly of Vienna, and now with the Museum of Art at Providence. Dr. Schwarz feels that a substantial part of the success of Hill is due to the work of his chemist friend, Robert Adamson, at whose death Hill gave up photography and returned to painting. Hill died in 1870, a fact unrecorded in the photographic journals of his day.

The value in studying Hill, for the amateur, and perhaps the professional too, is to gain the very right thought that success in photography is related so little, so very little, to materials.

Then we learn to do justice to the subject by recognizing his attitude, his own vibrant force which is his very unique and personal reflection of life. To portray that is the aim. To do it as Hill did, after the compositional artistic manner of portrait painters of his day, is one way.

AVAILABLE REFERENCE SOURCES:

Schwarz, H.: David Octavius Hill, der Meister der Photographie, Leipsig, 1931.

Schwarz, H.: English translation of the above. Viking Press, 1931.

London Art Journal: (New Series) Vol. viii 1869.

Camera Work: 1905, No. 2; 1909, No. 28; 1912, No. 37.

British Journal of Photography, 1903, page 282.

Goldschmidt (London) An album of 150 Hill calotypes.

Museum of Fine Arts, Buffalo, N. Y. Voluminous Hill reference material.

Photography: A Short Critical History: Beaumont Newhall, Museum of Modern Art, N. Y.

Photographic Journal of America "D. O. Hill and his work" by F. C. Inglis.

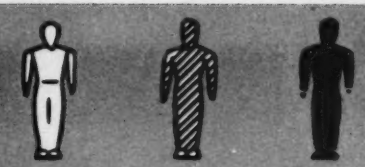
Journal of Edinburgh (Scot.) Phot. Soc. 1909.

Catelouge of the Epstean Collection on History and Science of Photography, Columbia University, 1937.

SIR FRANCIS GRANT, P.R.A., fashionable portrait painter, of such celebrities as the Queen and Lord Melbourne, Macaulay, and Landseer. By D. O. Hill.

SPECIAL EFFECTS

HOW TO PUT THEM IN YOUR PICTURES



Would you like to see materials that permit special effects, such as paper, toners, film, etc. treated as Gus Wolfman (of E. Leitz) explains filters in this article? Write the editor of Minicam Photography, 22 East 12th St., Cincinnati, Ohio. We welcome your suggestions.

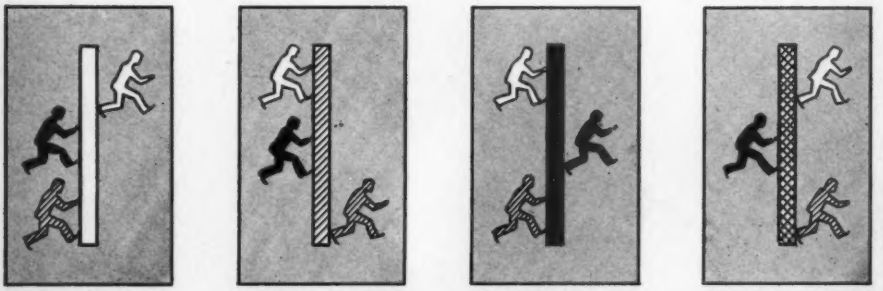
A CURIOUS paradox is ever present in photography: while scientists create methods bringing the perfect negative a little closer, the photographer reaches for a technique that preserves the personal factor. Using a *filter* is one of the many ways of bringing distinction to your photographs, and of placing an emphasis where you desire it.

What is a filter and what will it do?

The answer is simple: It is a piece of colored glass, or colored gelatin cemented between two pieces of glass. The filter is usually round and may be permanently fitted into a mount which slips over the front of the lens; or the filter can be supplied without a mount for use with special interchangeable mounts.

Most of us have used filters. We know that they are necessary to prevent us from getting blank skies when photographing landscapes. Let's investigate the basic facts behind the filter:

1. The main reason for using the filter is that films and the eye do not "see" colors the same way. Films are oversensitive to blue; so much so, that blue photographs practically white. A blue sky may appear blank white, without tone, in a print. Some films are too



THE "LITTLE MEN" above represent the three primary colors of light—red, green and blue-violet. As seen by the actions of the men the red filter holds back green and blue-violet and allows red to pass through; the green filter retards red and blue-violet, and permits free passage to green; the blue-violet filter allows its own color to pass through, acting as a barrier to other colors; while a yellow filter holds back blue-violet and permits red and green to pass through. The latter is because yellow light actually is composed of a mixture of red and green light.

sensitive to red. In portraits, lips will appear too pale.

2. A second reason for using the filter is to create effects that make better pictures. You may want certain objects to appear lighter or darker than they naturally are.

There are a few facts about light which will enable you to easily understand how to use filters properly.

White light is really a mixture of all the colors of light. There are three basic or primary colors of light, which are red, green and blue-violet. All other colors can be obtained by mixtures of these three. Thus, yellow light is obtained through a mixture of red and green.

A filter will freely pass the light of its own color but will hold back the other colors of light. Therefore, objects which are the same color as the filter will appear lighter in the print, whereas objects of other colors will be darker.

These are essentially the basic facts on the use of filters. Now let us apply them to an actual case.

We are photographing a landscape in which there is a deep blue sky, a red brick house and green vegetation in the foreground. We know that the film is too sensitive to blue, so a straight shot without a filter will net us a blank sky in which the clouds are lost. Our main problem is to hold back some of the blue light of the sky, so that the latter will reproduce in a definite tone and white clouds will stand out. At the same time, we want the red brick house and green vegetation to reproduce properly.

Which filter? Well, let's go back to our primaries—red, green and blue-violet. A red filter holds back blue. But, it also retards green, so that the green vegetation will reproduce dark. Since it permits the light of its own color to pass freely, the red brick house may be too light.

A green filter will also hold back blue, but, here again we upset the balances, because it holds back red so the house will reproduce dark, and the green vegetation will reproduce light. We need a filter that will hold back blue light and permit red and green to pass through it. Since yellow light is a mixture of red and green the answer is the yellow filter.

So much for landscapes. Let us see how to use filters properly when photographing objects indoors.

Our objects are a red vase against a green background. Both colors are of equal value, which means that when photographed they will both be of the same shade of grey. This is not satisfactory. One should be darker or lighter than the other. Which filter to use will depend upon the effect you want to obtain. You know that a filter passes the light of its own color but holds back the other colors of light. Therefore, a red filter will produce a light vase and dark background, and a green filter yields opposite results.

If a filter is a specific color it does not necessarily hold back all light of different colors. You may have guessed that because there are different types of filters of the same color, as light, medium and dark yellow, light red and dark red, etc. Some of the "unwanted" light will pass through but the darker the color of the filter, the more "unwanted" light it holds back. A light yellow filter may hold back a relatively small amount of blue light but the darker yellow filter will hold back considerably more, with the result that it will reproduce a blue sky darker.

If a very deep yellow, then orange, and the red filters are used the sky is reproduced progressively darker—as a matter of fact, darker than it normally is. Now you are "over-correcting"; you are creating special effects. Even though the result is not an actual interpretation of the scene, it may nevertheless be a more effective picture.

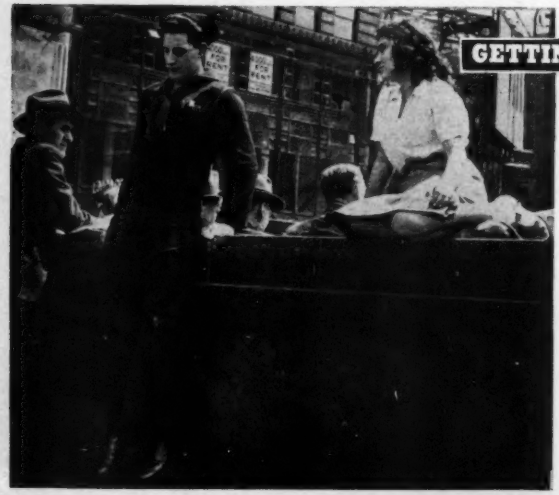
In this respect you can liken filters to sieves. The denser the color of the filter —the finer the mesh—the more it holds back. Also, the longer you allow a mixture to remain in a sieve, the more

(Continued to page 97)

ON DUFFY SQUARE

PHOTOGRAPHS BY SKIPPY EDELMAN

SKIPPY EDELMAN, no salon photographer, shows in these genial documents how life on Duffy Square pursues its ancient way, in modern dress. Is there a place for this, alongside of snow scenes, tubs of apples and the pickle barrels that make a prosaic pattern of our photographic salons? If so, why not make that place for yourself? Skippy's pictures are, as you can see, full of all the zip and dash of Duffy Square, but the composition and print quality may make strong camera club presidents shudder. Who is there to mix the two—salon quality, and the singling out, for interpretation, of one phase of life today?



GETTING ACQUAINTED

THE DIVINE COMEDY.

Act 1. Scene 1.

Boy enters dressed as maritime seaman. Hoists himself up on rail alongside girl. Character super on left senses what is coming and decides to edge in. *Girl*, who has been sitting, waiting, thinks it's high time, and wastes no time looking the other way. Three heavies, oblivious, keep backs towards boy and girl.

BOY

What time is it, do you think?

THE APPROACH

Act 1. Scene 2

Character super lifts self on rail, turning face right, with ear to newly formed couple. Heavies in rear remain oblivious. *Girl* brushes hair upwards and lifting her hair, looks straight at boy.

GIRL: I don't know. Do you?

WHERE ROMANCE BLOOMS

A NEAR MISS

THE Duffy Square canteen, if you could call it a canteen, is that triangle of pavement in New York City holding up the Rev. Father Francis Duffy's statue on the south; 48th Street on the north; and Broadway and Seventh Avenue to west and east.

There are no sponsors, directors, or organized play in Duffy Square, nor anybody asking how long since you wrote home. All there is, is a lot of sailors, and a great many girls, who stroll past, stop, talk, make dates, flirt, refuse to flirt—well, you know girls.

The floor show, with all-shoeshine boy cast, has boys who dance, boys who sing, and put on mock prizefights. The sailors toss coins to the performers, and submit to having shoes shined as often as twice an hour. A third attraction is pigeon feeding.

TARGET FOR TONIGHT

There are less complicated characters who don't give a darn whether Jane looks or not, or whether the pigeons are really tame, or whether their shoes have gone unshined for twenty minutes. These sailors go to Duffy Square to get a place to sit down. Men have married for less.

(*Top*) **SAILOR,** trying to get friendly with two bare legged girls, is brushed off. (*Center*) Girl waiting for her friend to return with a jelly-apple. (*Lower*) Girl returns. After Coast guardsmen get their shines, a double date sends them off together.

SUCCESS OF TWO FOURSOME

1 ONE WAY the girls effect introductions is with a box camera. Often a pair will stop in front of a group of sailors, while one says, "Mabel, take my pitcha." Mabel replies, "Okay, stand by those cute sailors — wanna get in the pitcha, sailors?" That's the girls.

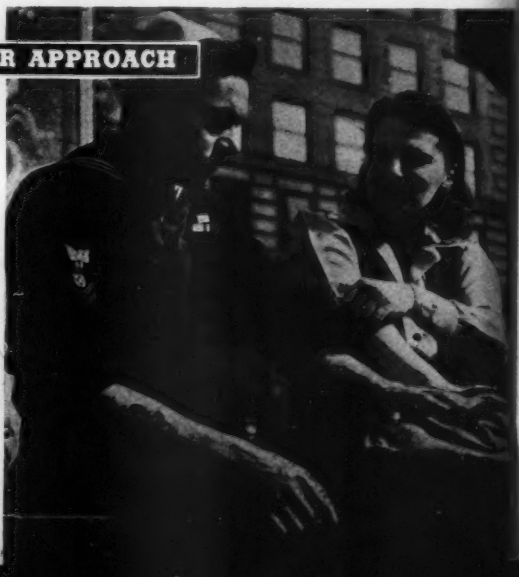
Here are four of them, armed with a lone box camera. But even that fragile obscura is more than enough. Behind are four sailors. In this picture, Mabel has already spoken, and the sailors turn to accommodate.

2 EVERYONE obliges, and with Father Duffy in the background the picture is made.

3 ACROSS the street to Whelan Drug for a coke; as the two other girls dashed ahead to "beat the light".

OFFICIAL canteens for service men which are cool and antiseptic perhaps had something to do with the unofficial curbstone canteen that has grown up in Duffy Square.

ANOTHER APPROACH

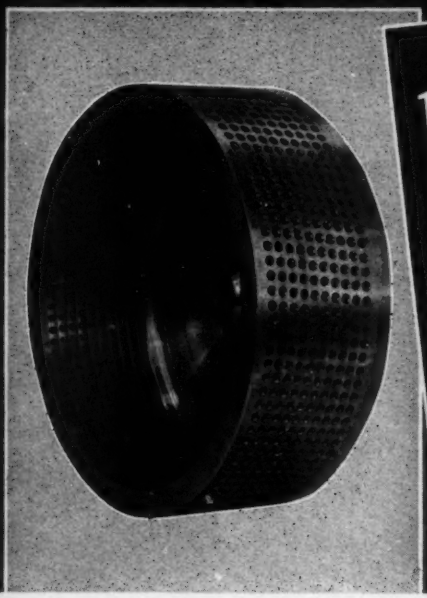


4 INTRODUCTIONS on Duffy Square are touch and go, as varied and delightful as young people themselves. The older the gag, the more the girl (or boy) feels at ease. Here, a sailor suddenly taken by sunburn on his arm remarks: "Gee, I'm darker than you." The girl, baring her arm, agrees. Now they're acquainted.

And so, as the sun rises in the little harbor that is Duffy Square, and the noon hour sends crowds hustling by, we take leave of this pleasant vista, and — say, Burton Holmes, who let you in?

WHO CARES? Edelman—from *Three Lions*

SKIPPY EDELMAN wraps up his photographic prejudices: "Sensational camera angles and super-dramatic lighting, as a rule, have no place in newspaper photography. They tend to make the reader admire the skill of the photographer, instead of what he has to say."



120,000 FRAMES PER SECOND . . .

The history and use of high speed cameras — their future — their fundamental principles

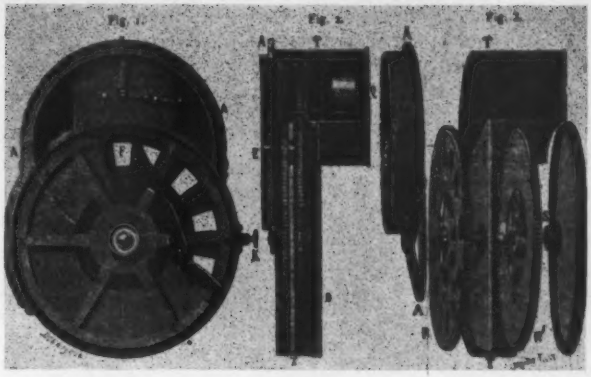
By FREDERIC LUTHER

IN MANY branches of scientific research the phenomena studied are characterized by a cycle of action too rapid for critical analysis by the human eye. The flight configuration of a hummingbird's wings, the surge in a motor valve spring; the strains in a construction material subject to sudden shock, the action of the vocal cords; the lift coefficient of an airfoil, the play of muscles in a running antelope; all these questions, some products of the machine age, some as old as the Aristotelian method of investigation, have at various times been the subject of serious study. All of them have finally been solved through the application of high speed motion pictures.

It all began in 1824, when an English scientist, Peter Mark Roget (whose compilation of synonyms and antonyms for his literary efforts resulted in the well-known *"Roget's Thesaurus of English Words and Phrases"*), read a paper on "The Persistence of Vision with Regard to Moving Objects" before the Royal Society in London; Roget had formulated his thesis after observing the apparent distortion of the spokes of moving carriage wheels when viewed through a picket fence.

The publication of Roget's paper set off a flurry of speculation on how this persistence of vision could be utilized in making motion pictures. Many inventions resulted from these speculations, such as the zoetrope, a device in which drawings on the inside of a revolving cylinder appear like a single animated figure when viewed through slits in the cylinder.

A patent was granted a Philadelphia mechanical engineer for the production in 1860 of a sort of zoetrope in which the drawings had been replaced by sequence photographs; when the wheel was spun the action of a boy driving a nail was reproduced quite realistically. Because of the slowness of the photographic materials, however, the entire series of pictures had been posed one at a time and though the effect was interesting it had little value in the analysis of motion.



JANSSEN'S PHOTOGRAPHIC REVOLVER, 1873
R—Shutter disk, with shutter slits visible
R'—Disk acting as plate holder
F—Fixed aperture
K—Start-stop button
P—Photographic plate

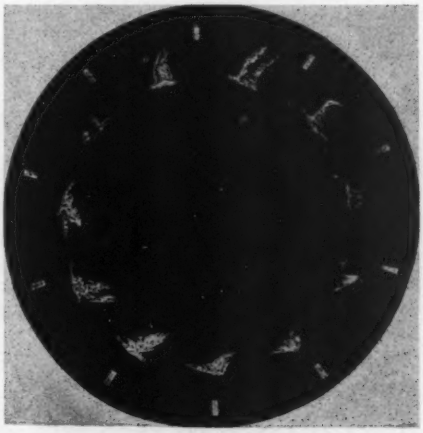
Fig. 2

In 1873, Pierre Jules Cesar Janssen, one of the greatest of French astronomers, was faced with the problem of determining the exact moment of apparent contact of the planet Venus with the Sun during the transit predicted for the following year. He devised a camera which operated by clockwork and exposed up to 48 pictures at regular predetermined intervals. Since he was photographing the face of the sun his exposures could be sufficiently short to use the plates then available on the market.

Janssen's camera consisted of a disk on which his circular sensitized plate was mounted; a fixed aperture placed so that the image from the objective could be focused through it on to the plate; a revolving disk to act as a shutter, with

THE PHOTOGRAPHIC "we" of the 80's. Marey with his photographic rifle, 1881. Notice the holder for extra plates hanging at his side.

Fig. 3



MAREY'S phenakistoscope. After photographing the various phases of a sea gull with the photographic riffle, the single pictures were pasted on the disc, so that when it was rapidly revolved the movement of the bird's wings could be seen. Later Marey used a projector which he built himself.

Fig. 4

slits cut so as to sweep across the aperture; a spring motor drive; and an adapter to attach the camera to the refracting telescope (See Fig. 2).

Janssen dubbed his camera the "photographic revolver," and predicted its application to the study of animal locomotion, a subject of much discussion in the 'seventies and 'eighties.

Actually, when the camera was ready to prove itself, the transit of the planet, observed by Janssen and his party from a base in Japan, was photographed under unfavorable conditions with overcast skies, and the plate was underexposed; nevertheless, Janssen returned with 48 pictures perfectly sharp, and covering a cycle of 70 seconds, a speed of about one-and-a-quarter 1 x 1 centimeter "frames" per second. So impressive were the results that astronomers who saw the camera in Japan adopted it and made models of the "photographic revolver" to go along on their expeditions.

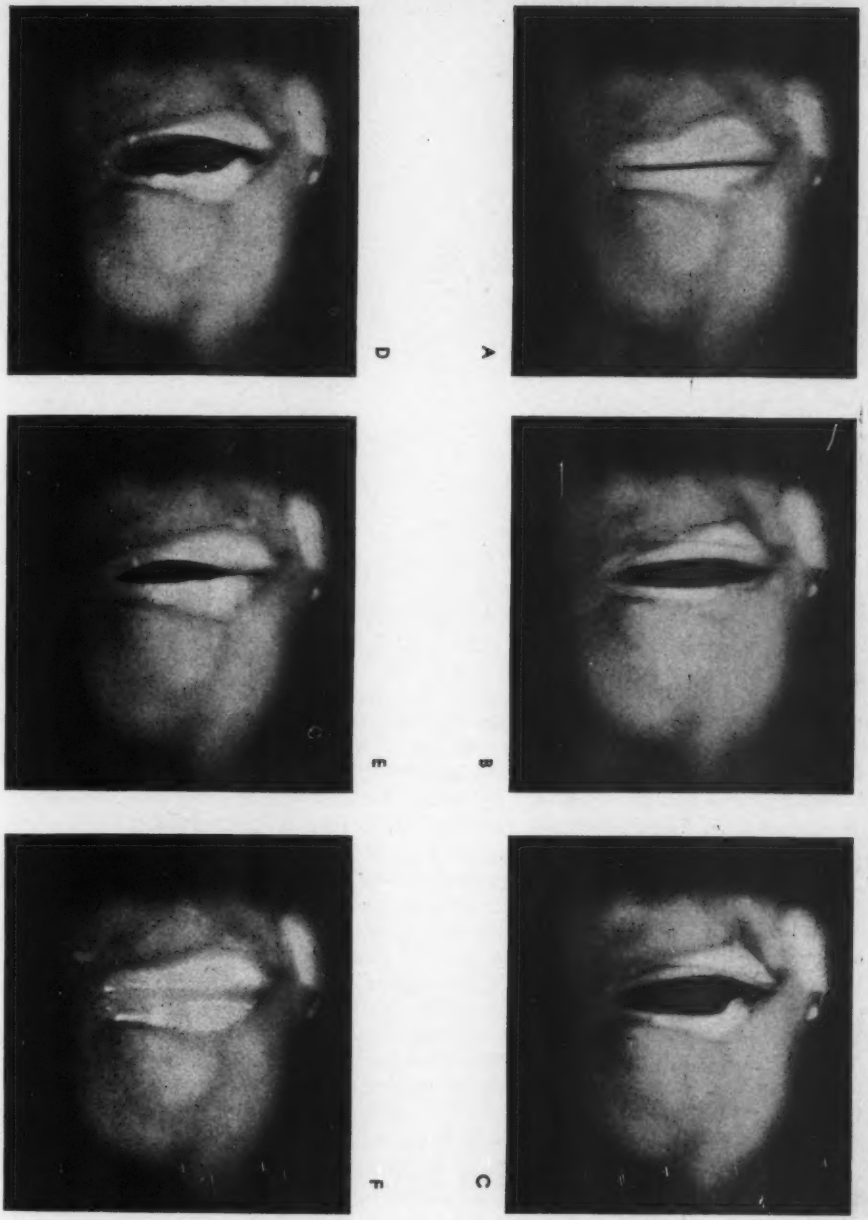
As mentioned above, the subject of animal locomotion was provocative of much discussion during this period. To the popular scientist the question of whether all four hooves of a trotting horse left the ground simultaneously was a matter for grave speculation; many long-winded discussions had strained the laws of logic and the tempers of men.

Among the disputants were two well-to-do Californians, Frederick MacCrellish and Leland Stanford (railway tycoon and racing enthusiast, later Governor and university founder). To prove his point Leland Stanford directed John D. Isaacs (an engineer for his Central Pacific Railroad) and Eadward Muybridge (an Englishman who at that time was a U. S. Government photographer stationed in California) to make a rapid sequence record of a horse's stride. The two technicians moved out to Stanford's stock farm at Palo Alto and began their experiments in 1872. A slanting background designed to catch and reflect the sun's rays across the exercise track was erected. Opposite this background was placed a battery of cameras eventually numbering twenty-four. Across the track were stretched threads, one attached to each camera's shutter by means of an electrical relay; as the horse broke each thread in turn a separate photograph was taken, the interval between exposures being determined, of course, by the distance between threads and the speed of the horse. Success in the experiment came in 1877, when a series of underexposed pictures (actually, little more than silhouettes) caused great excitement throughout the ranks of sportsmen and photographers. Unfortunately, the story travelled faster than the pictures, and we find the following derisive letter to the editor of the *Philadelphia Photographer* being published in August 1878:

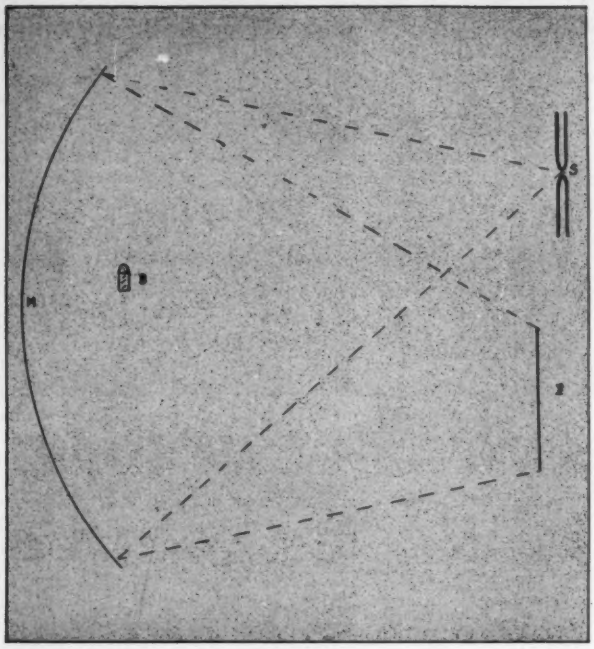
> None know better than yourself that the country is full of photographic quacks vending their nostrums, deceiving the credulous, and defrauding the ignorant. California is noted for its 'largest pumpkins', 'finest climate', and most 'phenomenal horse' in the world. So also it has a photographer! the dexterity of whose 'forefinger' invokes the aid of electricity in exposing his plate—a succession of plates, so as to photograph each particular respiration of the horse. The result is, a number of diminutive *silhouettes* of the animal on or against a white ground and wall; all these in the particular position it pleased him to assume, as the wheels of his chariot open and close the circuits. All this is new and wonderful. How could it be otherwise, emanating as it does from this land of miracles? Photographically speaking, it is 'bosh'; but then it amuses the 'boys', and shows that a horse trots part of the time and 'flies' the rest, a fact of 'utmost scientific importance.' Bosh again.
>
> Respectfully, your friend,
> WILLIAM H. RULOFSON.

The appearance of an elaborate volume on *"The Horse in Motion"* in 1882, with a foreword by Leland Stanford, set at rest the suspicions of persons like Mr. Rulofson.

The experiments of Eadward Muybridge continued, and he was brought to the University of Pennsylvania to continue his work. His method was patented in



THE HUMAN VOCAL CHORDS seldom seen, rarely photographed, though used so constantly in waking and dreaming. A high speed motion picture shot showing the different phases occuring during one cycle.



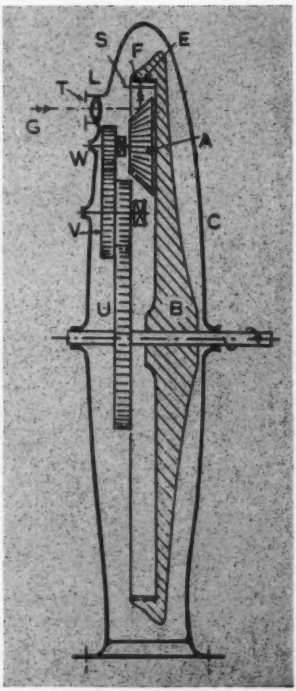
CRANZ'S CAMERA for photographing bullets in flight. The concave mirror (M) focused the light from the spark gap (S) on the film (F), while the subject (B) appeared as a silhouette against a light background.

Edgerton replaced the open spark with a gaseous discharge tube synchronized with the drive sprocket of a continuous travel motion picture camera to obtain a succession of ultra short exposures. Also, he replaced the mirror by a lens, thus permitting full tone pictures.

Fig. 6

1879, and in 1883-84 he began to use a battery of forty cameras.

In 1881, Muybridge had lectured in Paris at the studio of Etienne Jules Marey. Marey was one of France's foremost physiologists, a serious research scientist who had spent many years on the study of animal locomotion and the flight of birds; he also was founder of the renowned Marey Institute. Of the same age as Muybridge (who was 51 years old at this time), Dr. Marey saw in the new analytical method a means of testing his own theories. However, the flight of a bird could not be so controlled as to use the stationary cameras of the California experiments. Accordingly, the physiologist went back to the "photographic revolver" of Dr. Jenssen who, as we have already seen, had predicted its use for studies such as those of Marey. Attached to a gunstock for ease in following the flight of a bird (See Fig. 3), Marey's invention was called a



THE JAPANESE CAMERA, 1930

A—Mirror compensator with 180 mirrors.
B—Circular drum, 4 feet 7 inches in diameter; side view.
E—Inner surface of drum B.
F—Film. Held against E by centrifugal pressure.
L—Camera lens.
S—Adjustable aperture slit.
T—Automatic shutter to prevent double exposures.
U, V, W—Coupling gears.

Fig. 7

"photographic rifle." A long focus lens was placed at the muzzle end, and the clockwork motor was started and stopped by a trigger similar to that of a regular gun. The extra plates, carried in a case slung on a shoulder strap, were either round or octagonal; in the camera they were rotated at a speed calculated to give about 12 images per second, at an exposure of about one two-hundredth of a second each. Whereas Muybridge had taken silhouettes against a bright background in his early experiments, Marey used a jet black background to set off his light-colored seagulls, his slower shutter speed (one two-hundredth, as compared with one one-thousandth of a second or less for Muybridge) giving a full-tone reproduction of the birds.

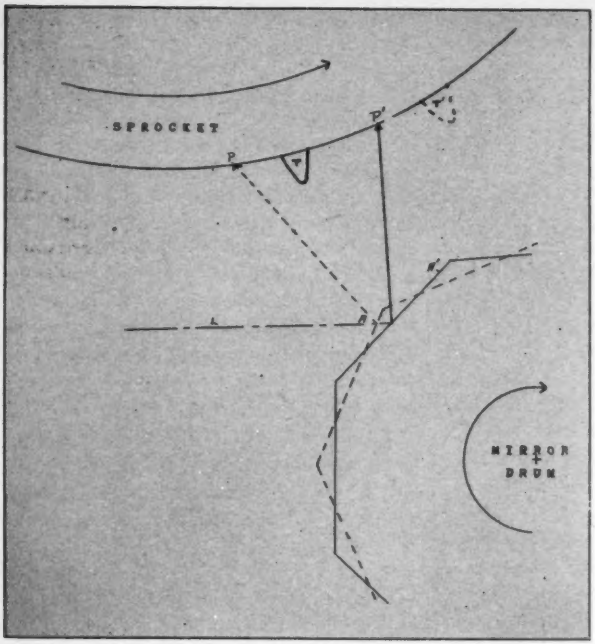
One inevitably feels of Jules Marey that he was a crusty individual, with the punctilious scientist's scorn for vulgarization. When it was suggested that he synthesize the component pictures of his studies on flight, he snorted that such foolishness was "primarily for the amusement of small and grown-up children!"; what must he have thought, were he alive today, to see hundreds of millions of tiny still photographs synthesized into the love story of a Charles Boyer, the growing pains of a Mickey Rooney, or (a Marey horror of horrors) a tale of Donald Duck!

But Etienne Jules Marey, august member of the non-frivolous Institut de France, eventually consented to the synthesis of his pictures. Whether goaded by personal desire to recreate the beauty of flight, or irritated by the suggestions of skeptics that the analysis was not made from real life, Marey finally came to use the Phenakistoscope originally conceived by Joseph Plateau. Here (Fig. 4) a disk carried the sequence of photographs keyed to a series of slits in the disk. The observer looked through the slits from the back as the disk was spun before a mirror. Later, Marey constructed a zeotrope in which painted wax models made from his photographs could be viewed by several persons simultaneously.

When paper-backed stripping film arrived on the market about 1887, Marey adapted his camera to its use. No longer did it resemble a rifle, but was housed in a square box. An escapement mechanism controlled the film travel from spool to spool, stopping the film at those moments when a disk shutter similar to Janssen's tripped an electromagnet just before exposure; the frames were about three-and-a-half inches square. In 1888 he replaced the solenoid shutter with a purely mechanical action to simplify the camera, and eventually was using film 66 feet long to enable him to record many cycles of motion without having to stop to reload.

Back in America the interest in analysis of animal locomotion was continuing unabated. In 1887, a Mr. J. M. Cornell came to a Brooklyn geologist and amateur photographer, Wallace Goold Levison, for help in solving his problems in "certain physiological studies." Levison set to work and devised a camera which he soon afterwards described as "probably the first ever constructed for taking a number of pictures in rapid succession on separate regular dry plates." Thus, Levison's camera obviated Muybridge's undesirable features in that the pictures, all taken in a single camera, could follow the horse; the multicamera battery of the California experiments had been entirely satisfactory for analysis (i. e., determining the various components of the animal's gait), but when synthesized into motion pictures by Meissonier's projecting zoetrope the horse appeared to run on a treadmill while the background rushed past.

Levison suggested that future modifications of the camera might incorporate the newly introduced stripping paper, "now, I am informed, furnished in rolls affording 100 pictures." Levison also suggested the use of his camera to Thomas Edison, who was then experimenting with recording the gestures of a speaker while recording his speech on the Edison phonograph, the finished picture and voice being reproduced on a synchronized phono-



PRINCIPLE of the optical compensator, mirror type, camera, as used in the German and Japanese equipment. After passing through the camera lens, a hypothetical light ray, L, strikes the mirror face at A and is reflected to point P on the film. By the time the mirror has moved until A has advanced to position A' the changing face of the mirror deflects the light ray along path L' to point P'. Notice that P' is in the same position relative to the new position of the sprocket tooth T' as P was to the old position T.

Fig. 8

graph and zoopraxiscope.

Edison, however, had been working with the Muybridge system. In one of his rare moments when he failed to visualize the commercial possibilities of one of his inventions, he declared his belief that the motion picture had but a short-lived future as a form of public entertainment; that after a brief interlude as a novelty, it would be forgotten by all save those students who wished to recapture the looks and gestures of an outstanding orator on some memorable occasion. The projection of motion pictures on a screen, to be viewed by a number of people at any one time, would merely hasten the inevitable day of public ennui.

Accordingly, Edison's first motion picture equipment was in the form of tiny pictures in a long spiral attached to a cylinder somewhat resembling that of his early phonograph; the lone observer viewed the pictures (which moved into position with an intermittent movement) through a low-powered microscope. In the latter part of 1889 the inventor decided to replace his earlier system with a single camera using a belt of film. He bought some of George Eastman's first nitro-cellulose film (which Eastman started producing in August of that year) in rolls 35mm. wide, a gauge which ever since has been the world standard for professional cinematography. On October 6, 1889 he demonstrated the peep-show kinetoscope, with a 50-foot continuous belt of film which ran for 13 seconds at 48 frames per second. Perfection and production were slow, however, and Edison was unable to finish his machine in time for showing at the Columbian Exposition in Chicago in 1893, and the first public appearance had to wait until April 14, 1894, the event taking place in an amusement arcade at 1155 Broadway in New York.

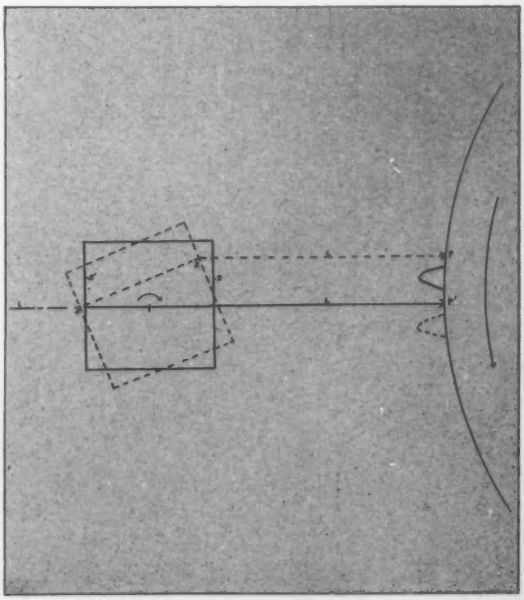
A little more than a year after this Thomas Armat rediscovered and patented in U.S.A. the intermittent mechanism first used by Henry Renno Heyl in Philadelphia, more than a quarter century before. Pressure being brought upon Edison to

provide a projector for his Kinetoscope peep-shows, he finally agreed to market the Armat machine under the name of "Vitascope", and thus laid the foundation for the present day motion picture projection units.

The use of pictures made by intermittent-type cameras at above-normal speeds was soon recognized as an invaluable aid to many types of problems. Outstanding among these today are such subjects as athletic events and photo-finish horse races, most of which are filmed at speeds in the neighborhood of five to ten times normal. Less well-known because Hollywood regards it as a form of trade secret is the use of high speed pictures taken with standard intermittent cameras on the so-called miniature sets. A carefully executed article on the subject, published by the Society of Motion Picture Engineers in 1924, revealed that a definite ratio exists between the camera speed and the effect obtained. According to the formula of the author, *all linear dimensions appear to be magnified as the square of the time magnification;* thus, by applying the formula we find that a ten-foot model of a liner photographed at ten times normal camera speed behaves on the screen exactly as would a 1000-foot ocean greyhound photographed at normal speed.

Pictures made with intermittent camera movements are actually a series of still pictures taken at a relatively high rate of speed. As such, they are unquestionably superior to all types of cameras employing continuous film travel. Nevertheless, the arbitrary limit of 250 frames per second imposed upon the intermittent movement by the low tensile strength of the film base long ago proved too slow for many of the uses projected for high speed photographic analysis.

It was recognized at an early date that the exposure of a subject in a darkened room could be controlled by the duration of illumination instead of by a mechanical shutter movement; originally investigated by Fox Talbot in the mid-nineteenth century, this method is best represented among today's photographers by the so-called "open-flash" single exposure method. In their search for a light source which would be of extremely short dura-



PRINCIPLE of the optical compensator, prism type, camera, as used in the Bell Laboratories equipment. After passing through the camera lens the light ray, L, strikes the prism face at A and is refracted, or bent, by the optical properties of the glass to B, where it is again refracted on passing from glass to air so as to strike the film at point P. By the time the prism has rotated until A has advanced to position A' the amount of refraction has gradually been reduced to zero, so that the ray passes straight through the prism unrefracted along path L' to point P'. As the prism continues to rotate the refraction sets in in the opposite direction (below line L') and the point of impact in the film plane progresses beyond P' until the opaqued corners of the prism and the fixed aperture combine to cut off the image entirely.

Fig. 9

tion while yet having a high illumination factor, the experimenters turned to the use of an open spark gap and research workers, notably Cranz, had photographed during the last war the compressions and rarefactions of air molecules disturbed by a bullet travelling some 4,000 feet per second. (See Fig. 6.)

The greatest publicity regarding the use of a rapidly flashing light source for making high speed motion pictures has been given the work of Dr. Harold E. Edgerton and his associates at the Massachusetts Institute of Technology. Edgerton has ably presented, in a series of papers, articles, and books published from 1931 to the present time, the case for the unit he calls the stroboscopic-light camera. In this camera the film travels past the lens at a continuous rate of speed. Each time the film has moved the distance occupied by one frame the subject is illuminated by a momentary flash of high intensity light. The light system is normally a gas-filled tube, such as a mercury arc lamp which is discharged in rapid succession by an electrical condenser. By means of a commutator attached to the camera sprocket shaft the tube is discharged every time the film has moved one frame or the width of the fixed aperture, the exposure frequency thus being controlled directly by the film speed. The duration of exposure under such conditions is extremely short—it is measured in millionths of a second—and thus the camera can be completely shutterless. In taking pictures where a 16mm. film is exposed at a rate of 5,000 full-sized frames per second, the film travel reaches a speed of about 85 miles per hour; even at such speeds the films move so little during the brief exposure that blurring of the image is not noticeable.

Several disadvantages are inherent in the intermittent flash camera, however. One is the difficulty of obtaining satisfactory full-tone films in color, a difficulty due to the discontinuous spectrum of the gaseous discharge lamp. Another is the lack of adaptability for the photography of self-luminous incandescent objects by this method; it is obvious that where the picture frequency is determined by the rapid flashing of the source of illumination a subject which gives off its own light continuously will produce nothing but a streak on the film. A third is the

"It's Patty Jordan. She wants to know if you found a pair of gloves in the seat she sat in?"

rather complex electrical network needed to produce the intermittent flash at high intensity.

In 1894, C. F. Jenkins, an American inventor who had worked with Armat on a predecessor to the Vitascope, applied a second principle for securing a sharp image on continuously running film, by means of which he attained a picture frequency up to 250 per second. Jenkins accomplished his object by moving the image along with the film during the time the shutter was open; thus, while the film was continuously moving during the exposure period it was at rest with respect to the image. This result was obtained by mounting fifteen lenses on a rotating disk which revolved in synchronism with the film. Jenkins continually worked on improving his camera until thirty years later he could boast of having achieved a speed of over 3,000 frames per second with a 48-lens camera. The same principle was adopted for the camera announced by the German Askania Werke in 1933, which had a thirty-two lens arrangement.

Others meanwhile had worked on keeping a moving image in step with continuously travelling film, and the appearance of the Ernemann camera on the German market in 1916 was the culmination of earlier work by such European inventors as Mortier, Thorner, and Lehmann. Utilizing a revolving drum fitted with mirrors behind the lens to move the image in the same direction as the film (See Fig. 8), this so-called "Zeitlupe", or "time magnifier", was capable of up to 500 frames per second. Taken over by Zeiss, the mirror system was improved and the speed was stepped up to 1500 frames per second by the time Hitler repudiated the Versailles Treaty in 1937. Unfortunately, the camera was handicapped by the fact that the mirror system rigidly fixed the position of the taking lens, and all focusing had to be done by means of the introduction or removal of supplementary lenses.

A somewhat similar camera was built by Germany's Axis partner, Japan, in 1926 for aeronautical research. An improved model of this early camera appeared in 1929 and 1930 (See Fig. 7). Since the strength of cellulose nitrate or acetate film base limits the speed with which it can travel from spool to spool to about 100 miles per hour, this limiting picture frequencies to 2350 full-size 35mm. frames, or 6,000 full-size 16mm. frames per second, Toyotaro Suhara, Professor of Aeronautical Engineering at Tokyo Imperial University, and Sidutake Kamei, Assistant Engineer, decided to mount the film on the inside of a rotating drum for support (Fig. 7-E). Geared to the film drum is a frustum (Fig. 7-A), made of stainless steel and having 180 highly polished faces; this frustum revolves in synchronism with the film drum. Carrying a load of about 13 feet of film on the film drum, and with the frustum turning at a speed of about 13,500 rpm., the 180 mirrors give a series of 1,000 frames, each approximately the size of a frame from standard eight millimeter amateur film, at a taking rate of 40,000 frames per second. Since the film can be exposed during only one revolution, an automatic shutter (Fig. 7-T) closes to prevent double exposure; the entire photographic operation is over in one-fortieth of a second. Dr. Suhara also built a later model of this camera which was capable of a speed of 60,000 frames per second, and it is probable that this camera was used in some of the early developmental work on the flight characteristics of the famed Japanese Zero.

While the Germans and the Japanese were perfecting the mirror-reflection type of camera, American designers were developing a relatively simple form of optical compensator camera for high speed studies. Utilizing the refractive property of glass to displace the image on its way to the film, they designed a compact unit easily manufactured and easily operated. Going back to the practice of film travelling continuously past a fixed aperture, they introduced a rotating

glass block between lens and film plane (See Fig 9). In the early (1932) models this block was merely a plane parallel glass plate; later (1937) this "optical compensator" had become a glass cube. Designed primarily for use with 100-foot lengths of standard 16mm. film, the camera in its earliest form was the product of Mr. F. E. Tuttle of the Kodak Laboratories. Developments have been adapted to this by the Bell Telephone Laboratories. Small in size, the camera complete with twin motors for driving the film and the take-up reel measures but a foot square overall and weighs but forty pounds, as compared with a height of between five and six feet and a weight measured in tons for the Japanese camera; this feature makes the American camera much more easily used in restricted areas.

In the American camera the compensator prism is geared to the film drive sprocket in such a manner that absolute synchronism is maintained between image travel and film travel. While the Kodak camera utilized a disk shutter to intercept the light while the compensator plate was bringing its opposite face into position for the next frame, the Bell Laboratories model is shutterless, the corners of the cube being opaqued to eliminate troublesome cross-refraction and also to act as a sort of barrel shutter. The early models also incorporated an electronic impulse clock which gave the elapsed time accurate to a thousandth of a second; experience showed that in the majority of applications such an accessory was not needed, and the interval between successive frames is now determined directly from the camera speed. This speed is variable, yet is held well below the film danger point, usually at about 4,000 to 5,000 frames per second; at this speed the drive sprocket is rotating at some 12,000 rpm., and the optical cube at 60,000 rpm. To lessen the strain on sprocket holes the 16mm. film is double perforated (i. e., is identical with double-run 8mm. film before splitting).

Recently (1943) the Bell Laboratories engineers found that a standard eight millimeter frame is sufficiently large for the study of small fields, and they introduced an eight-sided compensator prism to interchange with the four-sided cube; thus, by stepping up from forty to eighty frames per foot they achieved an increase in taking speed of 8,000 to 10,000 frames per second without increasing the film speed. Eight millimeter films taken at this speed show remarkable sharpness and sufficient exposure, even with illumination furnished by a few 150-watt overvolted show window spotlights having the sealed beam reflector. Stereoscopic and Kodachrome pictures under raw and polarized light also have been taken successfully with this camera. In addition to its many uses in the telephone laboratories it has recently been made available to war contractors, and is being successfully applied to aeronautical and miscellaneous engineering studies. The main drawbacks to this type of camera are the limitation on exp. time due to the divergence of image and film paths, the limitation to 10,000 frames per second, and the high temperatures produced on the subject by the concentrated beams from arc or incandescent lamps.

PERHAPS the most bizarre camera of all for ultra-high-speed photography is that announced just at the outbreak of World War II by the late W. K. Rankin of the Philadelphia Works of the General Electric Company. Desiring to photograph the intensely brilliant arcs of electrical circuit breakers Dr. Rankin found he could run his film at nearly any conceivable speed without fear of underexposure, since the brilliancy of his subject was roughly equal to the reflection from 40 million watts in photoflood lamps; furthermore, the entire cycle of action he wished to record took place in but a fraction of a second.

Dr. Rankin therefore designed a metal drum about 14 inches in diameter (Page 36). A 4½ by 40-inch sheet of film is

fitted into the drum, emulsion out, and rests on the ridges seen in the illustration, being held in contact with the ridges by centrifugal force while the drum is revolving. The drum is installed in a steel camera case large enough for the operator to work within, and is driven at a speed of 7,200 rpm., by an electric motor.

Around the periphery of the drum are ten rows of 100 holes each, so arranged that no two can pass a given point at the same time; thus the drum bears a sweep series of 1,000 exposure apertures. Each of these is a pinhole aperture of .01 inch diameter and, as is the case with pinhole apertures, of universal focus. The film plane lies less than an inch behind the pinhole, and produces a "frame" about one-third of an inch square; this enables the camera to cover a field about 12x12 inches at a distance of two feet from the aperture. A horizontal slot extending the width of the drum serves as a fixed aperture to expose one of the pinholes at a time, and the entire operation of exposing 1,000 pictures is over in .008 second, a taking speed of 120,000 frames per second, the highest yet available. To synthesize the action taken by the G-E camera each of the thousand pictures must be enlarged to standard frame size on cine film; such synthesis is rarely required, however, by the nature of the subject filmed by the camera.

THE FOUR TYPES OF HIGH SPEED MOTION PICTURE CAMERAS

	ADVANTAGES	DISADVANTAGES
INTERMITTENT MECHANICAL:	1. Standard equipment, alway available. 2. Sharper images than continuous cameras.	1. Speed limited to 250 frames per second.
INTERMITTENT FLASH:	1. Extremely short exposure interval obtainable. 2. Uses cool illuminant.	1. Speed limited to 10,000 8mm. frames per second. 2. Cannot photograph self-luminous objects. 3. Difficult to obtain correct color reproduction with gaseous discharge lamps.
OPTICAL COMPENSATOR:	1. Can use incandescent light source, producing true color rendition. 2. Can photograph self-luminous objects.	1. Speed limited to 10,000 8mm. frames per second. 2. Subject overheated by use of focused incandescent filaments. 3. Divergence of film path and image path causes some lack of sharpness or limits speed of camera lens.
MULTIPLE OBJECTIVE:	1. Highest speed yet obtained. 2. No strain on the film.	1. Drum size limits length of film capacity. 2. Subject must be high intensity arc. 3. Images must be enlarged for synthesis in standard projectors.

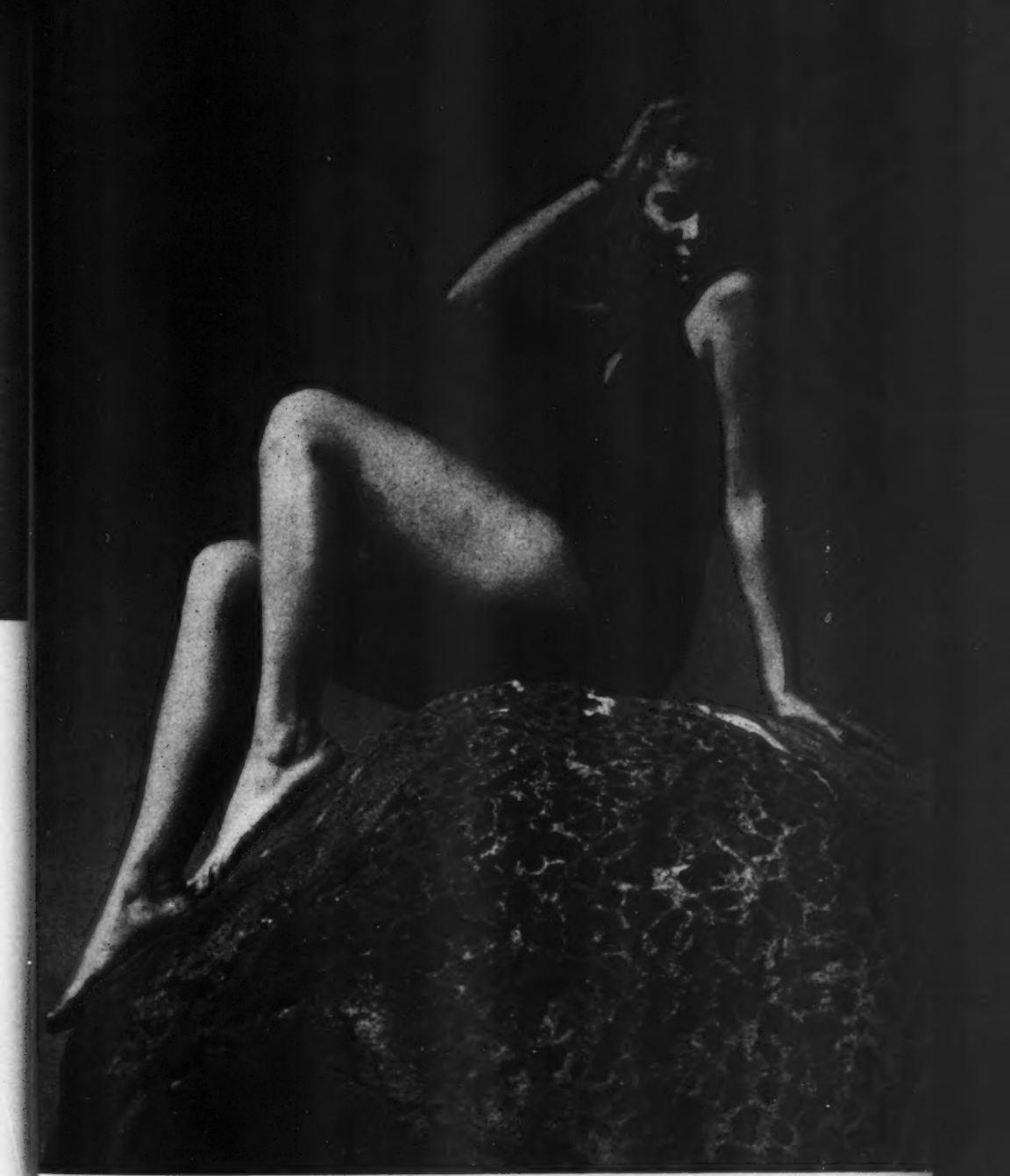
SWEET DREAMS

A SOLDIER'S PIN-UP GIRL (His Wife)

Sgt. O. C. Sweet, DEML Attachment, Camp Callan, Calif., spent most of his furlough photographing his wife, pretending she was a fashion model. When Sgt. Sweet goes to P. O. E. you can bet these pin-ups go, too.

THE EDITOR of "Better Homes and Gardens" is coming for tea. Are you ready?

(Above) What is it that men think so different but is seemingly so alike?
(Left) "Before taking these fashion shots," says the Sgt., "we studied mag poses."



"ALL THIS may mean to you," writes Sgt. Sweet, "is a babe on a rock. But to me, well . . . . Before taking these pictures, my wife and I wrote up each shot in a note book—definite wardrobe, background, expression, and hair style were decided upon.

"It was a day well spent, and swell fun; but when the sun went down we were fagged. That gave us an idea what professionals go through. I used a Rollie Automatic with a 'Sol' gun."

WEEGE IS

Arthur Fellig was given the name "Weegee" because New York cops never understood how he managed to be where-ever the story was biggest. Weegee looks for incongruity in a man's great moments of emotional crisis, the murderer playing with a piece of string in cell, the wayward girl bawling out the cop who arrests her, the lady on the fifth floor, grabbing her parrot, a second before she leaps into the fire net below.

THE most interesting man we know in New York City lives at 5 Center Market Place, opposite main police headquarters. His rooms resemble something O. Henry might have lived in. As you enter, there is a wide cot; next to it an ancient newspaper desk, covered some six feet high with pictures, newspapers, books, papers, being the accumulated litter of the reportorial mind that forever clips things and stores them on the first convenient piece of furniture. The wall is papered with signs resembling a fraternity dorm, including a

WHI
Wee
and

S A NATURAL...

WHEN THE fat lady at Coney Island painfully stoops over to tie her shoe laces and holds up traffic, Weejee's lens cap stays right on his camera. "The hell with sarcasm," he says, "I like ordinary people and I want pictures that laugh or cry right with the subject."

(Continued from page 51)

four-color pin-up of Gloria Gale—the one in which she is lighted by a circle of candles.

Police admonitions against traffic of various sorts are tacked, hit or miss, high and low, on the walls. Attached to the desk are a half-dozen plugs which connect this private apartment with every fire, police, and high-frequency radio signal used in the city of New York. No other home, except the Mayor's, enjoys the same disturbances. This combination living room, dining room, and bedroom takes up about as much space as an automobile—the rest of the apartment is one big darkroom. Here, too, is the litter and genial disarray that a man who lives alone and likes it may pile about himself.

To this part-Bowery, part Chinatown, part-tenement district have recently come emissaries of the Saturday Evening Post. The Magazine of Art, the Museum of Modern Art, Fortune, and the most energetic newspaper syndicate and picture magazine editors in the country. For, the tenant, Arthur Fellig, who calls himself "Weegee" (pronounced ouija,) is the highest-paid and most sought-after free-lance photographer in the little old New York.

Fortune paid him $125 for a single pic, and promised a bonus on publication. PM pays him $25 and up. Syndicates start at $50, and museums, as well as private collectors, seeking today's tempo in pictures, come to Weegee.

Working under great speed and tension, seeking the picture that is here for one split, terrifying moment, and then gone forever, under every disadvantageous condition a camera may face, Weegee gets fantastically fine results. He seeks to express people sympathetically, as they are at a crisis. Uneducated, rough and tough on the outside, he is, of course, a soft-hearted slob.

So, often articles about people are manufactured. The subject is dramatized, highlighted, blown up and dished out. As a favor, Weegee, who calls himself no writer, thrashed out a little copy for us. Written in the infamous style of his pix captions, his copy, faithfully reproduced by the editor's camera, follows:

↓

WEEGEE'S OWN STORY . . .

When I was fourteen years old I left school & went to work. my first job was in a SHIRT FACTORY at $3.50 a week, as I had no intest in shirt i quit the monotonous job after 3 days. I then went to work for a commercial photographer at $4.50 per week. my althoughmy ambition & hopes were to learn photography my work consisted of carrying heavy metal beds on a platform where they were photographed with a dummy matress, & also carrying a heavy IIxI4 view camera on outside jobs.as in them days everything was contact printing & enlarging being unheard of. after working in this place for 2 years. I one Sunday decided to solve the mystery of photography. being the only one in the

MORE

UNPOSED, true to life, these New York girls crowd around Harry James' orchestra as the trumpet plays hot and cold sending these young 'uns into a glowing star lit trance. A flash shot made with the see-around-the-corner gadget described on page 59.

studio.. I pulled the slide from one of the plate holders all I saw was the yellow coating of the glass plate; I got scared & panic stricken & pushed the slide back into the plate holder,when the holders were developed the next day & of course one of the plates was fogged. so the studio thinking there was a leak in the dark room. paimted the dark room black & also stuffed up all the corners & the ceiling & windows with felt. I KEPT QUITE.....

Then after working at numerous jobs from day laborer with pick & showel to bus boy in restaurants. I got a job with a photo XXXXXXXXXXX syndicate. which supplies photos to newspapers & magazines (ACME NEWSPICTURE ther I worked my self up to becoming a photo printer. & worked there for XXXX I5 years in the dark room making enlargements...getting tired of printing other photographers negatives. I decided to become one my self. so I quit the job.(IT took a lot of nerve to leave a steady $50.00 a week job.. so to get the courage to do this I took 2 drinks of whiskey.)& bought my self a second hand speed graphic..

I figured that in a busy place like NEW YORK with its millions of people . there ought to be enough things happening to keep my camera busy & profitable.So I made my ''headquarters'' in the press bldg at police hdqs. this being the nerve XXX center of the metropolis.and as most staff photographersare off duty during the night, XXXXXX with editors having to get them out of bed to cover a story So I made the hours of after midnight to 8 A M my working hours with XXXXXX editors depending upon me for coverage. without having to wake up their staff men & paying them overtime

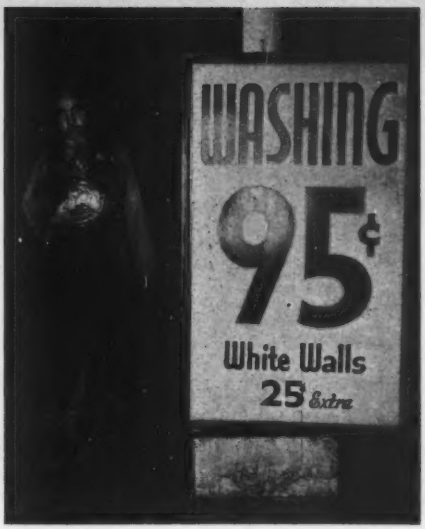
MORE

NOTHING LESS than life and death themselves could compose the deep feeling shown here. Arriving by taxi at a hotel, immediately after his beautiful stepdaughter fell from a window, Alador Laszlo, playwright, is snapped by Weegee in an unbroken moment of rare, exquisite grief. The editors of MINICAM offer this picture as a newsphoto that is fine art.

At first my picturs dint sell, but I soon found out why. XXXXXXXXXXX editors wanted . HUMAN INTERST... ACTION..... with a little cheese cake thrown in for good measure... So now adays say I go to a tenement fire. I dont bother to photograph the burning tenement, rather I concentrate on the human element the persons affected by the tragedy.that makes HUMAN & SALEABLE photograhsm . & I have been living a LUSH life for the past 8 years by following this simple formula,I have been offered staff jobs by the newspapers & magazines I deal with, But I laugh at them, I make more money than the staff men, & besides I have the independence XXXXXXXX to make the pictures I like... to me photography is more than a easy way of making a living with a few luxuries thrown in.. its an EMOTIONAL OUTLET..

Another reason IXXXXX turn down the jobs offered to me is I wouldnt be honest with my self working for them.. I like to photograph people as they really are. say a magazine wants a set of pictures on BOY meets Girl always a popular subject..so a Powers model is hired then a male model is hired from another agency. then the photographer taked the couple out on the beach & poses them with the LOVE LIGHT in their eyes.or the magazine wants a cover photo of MOTHER LOVE a MODEL is hired & than a search is made for a baby. to me this kind of photography STINKS... I see real sweethearts on [redacted]. beaches & on the streetswith that LOVE LIGHT in their eyes. & there are certainly enough real MOTHERS in this world without having to hire proffessional models.... rather than do this kind of artificial photography. I would rather go back to picking up dirty dishes & washing them in

QUE VA? What strange manner of character is this? Weegee found him prowling about the Bowery at night. Whence he came, where he goes, neither Weegee, nor perhaps the gentleman himself, knows.



INCONGRUITY is not as obvious as you might expect in the Bowery. This one-armed, sad-faced citizen trundles along in Chinatown, and passed a sign that seems to have a message for him as Weegee, makes the connection.

THE TWO black eyes, the two beers beneath two smiles, and me and Mamie O'Rourke, we call it quits and start again, on the sidewalks of New York. Unposed by Weegee.

restaurants again... & hold my self respect....Photography is more than a job with me its my life... I am 43 years old & still single& am in love with my camera. it is my dearest possession & my true love...

And heres another thing. A photographer should be HUMAN... UNDERSTANDING & SYMPHATETIC to his fellow beings.... say Im on the beach at CONEY ISLAND. its eay enough to spot a fat girl dressed in slacks & photograph her REAR END.. to me this is both STUPID & VULGAR..but if the same fat girls slacks should rip. & a kind motherly lady would sew the rip right on the beach.. this becomes both human & real....& not only would this incident draw a chuckle from the crowded people on the beach but readers seeing the picture published would have the same reaction. I came across an incident like this. took a picture of it. & it was used for a full page & got a bonus for it...

Another thing the photographer can get good & real pictures anticipating the human reaction..... say I am at a theatre the editors wants the people laughing.. this is easy. because people come to see a show oiforget their worries & to enjoy themselves So I watch for the peak of the acts & when the BELLY LAUGH arrives I am ready & capture in on the film... people like to be photographed & its up to the photographer & his camera to be human & to capture that spirit...

From the letters I get from all over the country photographers want to know my technique. secret formulas, ETC.... My technique is simple photography... I set my camera at IO feet... the shutter is set for I/200

MORE

(*Continued on page* 61)

CLOSE-UP of Weegee's Speed Graphic showing the outlet in the reflector for extra light. Notice outlets on battery case for 20 foot remote control cord and multiple flash.

TWO MIDGET bulbs for important shots.

A SMALL bulb (such as lights up a radio front panel) is attached to a battery by spring contact. When flash bulb is screwed in other end, light shines if bulb is OK.

FOR $5 Weegee "picked up a prism and had this mounted in front of my lens, enabling me to aim the camera away from the subject and get real candid shots while the subject is unaware. An angle view finder tells me if the view is centered." In the above case the camera would picture the object at the lower left of page 58, though seemingly aimed past the right hand margin of page 59.

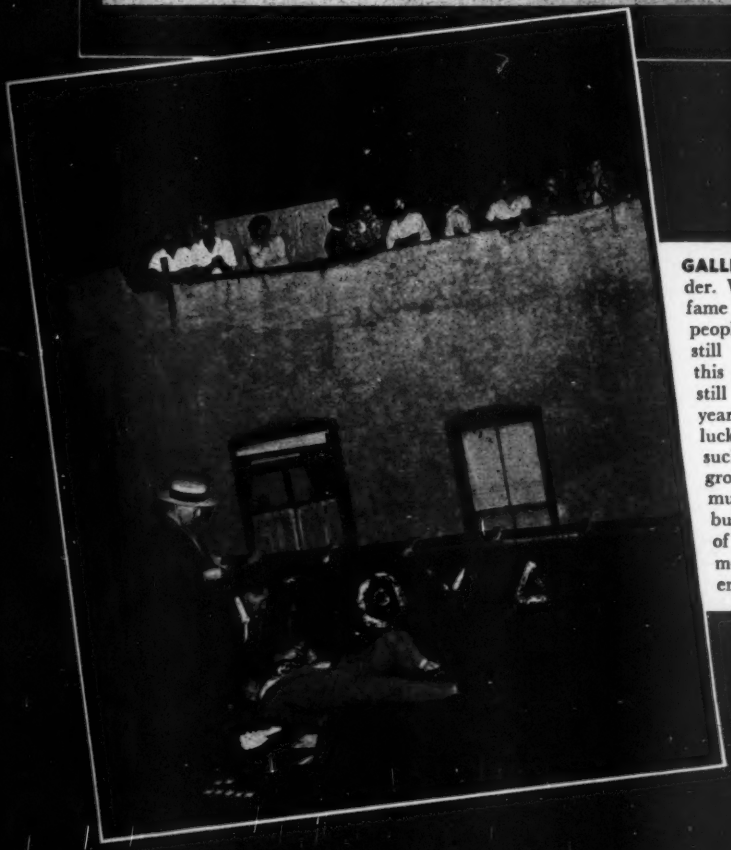
THE AUTHOR as he wrote this article. Note cigars, fireman boots, and extra camera. Stool goes back in trunk compartment and is brought out to type captions right after pix are made.

PLEASE DETACH STATEMENT BEFORE DEPOSITING CHECK
AND RETAIN FOR YOUR RECORDS

TIME, INCORPORATED NEW YORK, NEW YORK

TENDERED ATTACHED CHECK IN FULL SETTLEMENT OF ITEMS LISTED BELOW

EXPLANATION	DATE	AMOUNT	DISCOUNT	TOTAL
TWO MURDERS		35.00		35.00



GALLERY SEAT to a murder. Weegee made his early fame shooting murdered people while their blood still ran warm, and it is this sort of picture that is still his livelihood. Five years ago, Weegee was lucky to get $20 each for such pix. Today, his fame grows, not because of his murder jobs (see above), but on his interpretations of people in their moments of revelation in emotional crisis.

(*Concluded from page* 58)

part of a second. The stop is *f*.16, as most of my pictures are made at night. I always use a flash bulb. All my attention, once the camera is set, is on the thing I am about to photograph.

Of course, there are a few tricks I employ. Say a woman is arrested for killing her boy friend. When she arrives at police headquarters, she covers her face with a newspaper or pocketbook. So I hide, way back deep in the patrol wagon. When she steps in the wagon, I snap her. She gets mad, but I have the picture.

Other times I use a prism over the lens, which enables me to aim the camera away from the subject and still get it.

Say I arrive at a tenement house fire. First minutes count on a story like this . . . a woman is trapped on the fifth floor of the tenement . . . flames and smoke are all around her . . . she is screaming and threatening to jump. I have no time to change lenses, so I grab the camera with the telephoto lens and make the shots of her rescue. I get big enough figures on the film to make 11x14 prints. The big lens also comes in handy when I am photographing spectators at the circus or other public events, where I am after the reaction of the spectators. It enables me to stay 15 or 20 feet from the spectators and still get big enough figures to blow up; whereas if I used a shorter focus lens I would have to get much closer to my subjects and they, seeing my camera, would "freeze" up in their emotions.

Sometimes I may have to wait at police headquarters all week for a good story to break. And when that does happen, I must make sure that I get the picture with no excuses. So I am prepared. In my car, which I bought from the profits of my free lancing business, I keep a typewriter to write captions on the scene . . .a pair of firemens' rubber boots . . . a case of bulbs . . . films and *cigars* . . . also 2 4x5 Speed Graphics. One of the cameras has the standard 5¼ inch lens, the other camera has a 10 inch telephoto lens. Both lenses are synchronized to make flash photos.

Sometimes I may have to wait 8 hours outside a police station for a murderer to be brought out . . . and then it is maddening for the flash bulb not to go off. In cases like this, the prisoner is quickly rushed into a car and the photographer has only one chance to get the picture. Bulbs run pretty good, manufacturers testing all bulbs in the factory, but sometimes the fuse in the bulb may break while in the camera case.

I have invented a flash bulb tester. Before using the bulb I stick it in my tester. The other end of the tester (which looks like a fountain pen) has a small bulb such as is used to light up the front panel in a radio set. When this lights up in the tester, as the flash bulb is screwed in the other end, it shows that the bulb is good. To make further and absolute sure, I use 2 flash bulbs on important shots. Not that I get any more light. The reason I use 2 bulbs is that even if the timing should be bad on one of the bulbs, I will still get the picture.

I also picked up a $5 prism in a photo store on West 32nd St. in camera row. I have this mounted in front of my lens. This enables me to aim the camera away from the subject and get real candid shots with the subjects unaware.

When I am allowed in a station house, and the subject covers up, I rest the camera in front of the subject and walk away. My subject thinks I am going out for a cup of coffee, but when I reach the door, I push the button on a 20-foot remote control cable and get the picture.

And in conclusion a photographer should always be a gentleman . . . don't try to act as you see it in the movies. At fires watch the hose so you don't trip over it. At auto accidents don't smoke or throw lighted matches about . . . as the sparks will ignite the spilled gasoline and cause a fire. Don't photograph cops or firemen smoking, as they will be brought up on charges. Share your knowledge with the comers in photography who are groping in the dark.

★ TECHNIQUE IN ENLARGING

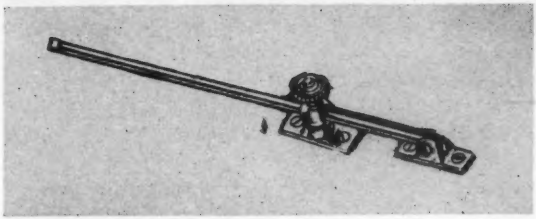
By PERCIVAL WILDE

VIBRATION in an enlarging machine is fatal to good prints. No matter how sharp the negative, the positive will be fuzzy. What is worse, it may be fuzzy in one direction: horizontally but not vertically—or vice versa—or in some direction even more bizarre. Yes, some textbooks explain that diffusion can be introduced by shaking the enlarger while projection is under way; but passing over the crude and unscientific nature of such an expedient, never to be recommended because a result obtained through it cannot be precisely duplicated, there is a world of difference between intentional softness, which may or may not make a portrait or a landscape more pleasing, and accidental mushiness, which is ruinous in architectural or mapping work. All departures from standard practice should be under the complete control of the operator, so that they may be reproduced again and again. No other rule will do so much to eliminate waste and improve the quality of the work.

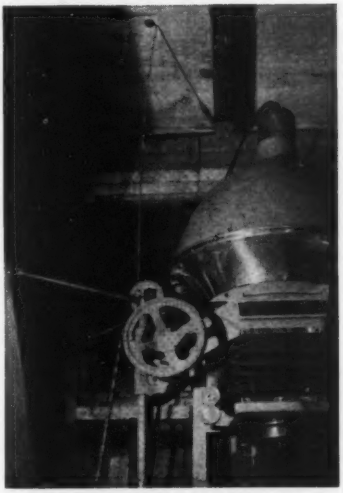
Let us begin, therefore, by providing a vibrationless base for the enlarging machine. A heavy plank solidly fastened to walls at either end is ideal. The table I use myself is built of heavy lumber. After being accurately leveled, all four legs were fastened to the floor by means of corner-brackets, and three sides of the table were similarly anchored to the surrounding walls. Before the screws were driven home the table was leveled again, shims being inserted wherever required, and there was a final, most scrupulous releveling before any attempt was made to set up the enlarger. It is obvious that even a cheap kitchen table (which, by the way, might cost more than my made-to-order table) can be immobilized and made into a solid foundation in the same manner.

The enlarger which I like is a heavy machine, weighing well over 100 pounds.* Its greatest height over all is 68 inches, and the tall column on which the projection unit slides would vibrate freely without suitable bracing. The manufacturer is not at fault: it is mathematically impossible to design a machine so heavy and so proportioned and make it vibration-proof. But the mail-order hardware catalogues offered a simple solution. Figure 1 shows a gadget described as a casement adjuster, and priced, last winter, at 33 cents each. At a nominal additional cost the village tinsmith removed the base with its two holes for screws from the socket through which the rod slides, and substituted a plug which fits tightly into the rolled edge of the enlarger column. Two such braces were fastened to the walls at 90 degrees to each other. They hold the machine solidly while it is in use, yet between sessions, when it is to be protected by an enlarger hood, they are detached in a matter of seconds, and without the use of tools. Once the set screws are loosened, the sliding members are free to move, and so much play enters the system that the plugs can easily be pulled out or pushed in. Figure 2 shows the braces connected; Figure 3 shows one of them disconnected. The vertical rod extending above the enlarger column is an older device, re-installed temporarily for the illustrations. It is a screen door brace, and can be bought in any hardware shop. One end is bolted to the enlarger; the other is screwed to the ceiling. The turn-buckle which comes with it allows a high tension to be set up. I

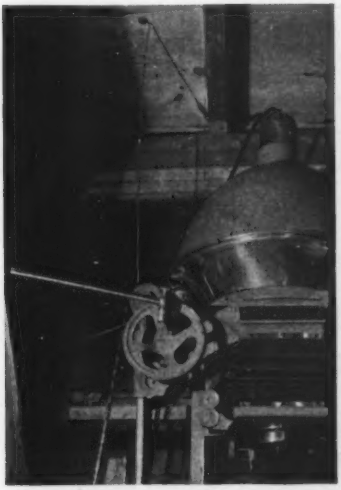
*Mr. Wilde uses an Elwood.—Ed.



THIS IS a casement adjuster sold, even today, by many hardware stores and mail order catalogues catering to the building trade. On casements it holds windows shut, or open to any degree desired. I use two to hold my enlarger. Both cost under $1.

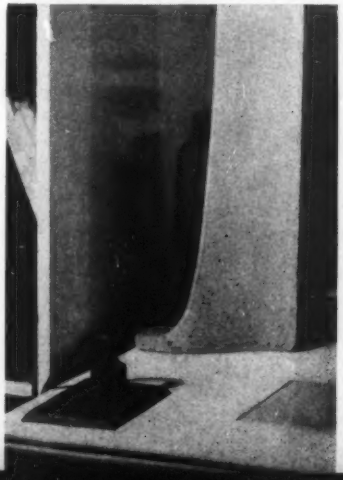


THE HEAVY enlarger is braced by a pair of casement adjusters. The set-up has been tested and is known to be true.



ONE BRACE disconnected. No tools are needed. Study the background and note how the enlarger sagged forward at once, introducing both vibration and angular error.

ENLARGER CONTROLS built in at a corner of the work table. The plug enters a convenience outlet and has nothing to do with the enlarger circuit. At lower right is a built in transilluminator.



gave it up only because its position made it impossible to cover the enlarger with a hood.

I suggest that similar braces, made from inexpensive fixtures to be found anywhere, can be attached to most enlargers. They cannot fail to improve the quality of their work. They are necessary for all but the smallest machines, and would be useful even with them.

The electrical switch supplied by the manufacturer is often a source of trouble. It dangles from a cable, which passes through it, and it is difficult to operate it in a dim light without introducing vibration. One solution, for those who are sure they will not step on it at an awkward

moment, is to replace it with a foot-switch. Another solution, and one which I have found excellent, is to install a toggle control in a steel box sunk into the table itself. Figure 4 shows the enlarger controls in my darkroom; the reason for the two switches will be dealt with in another article.

So far, so good, but we are by no means ready to commence work. Even more important than leveling the table, is leveling the enlarger itself, for if it is out of true we cannot avoid distortion. Granted that we may wish to introduce distortion: indeed, I have rarely made a portrait, and never a full-length, which was not bettered by a bit of distortion, often so slight that not even the subject could detect it; but, as this article has previously suggested, departures from standard practice should be under the complete control of the operator.

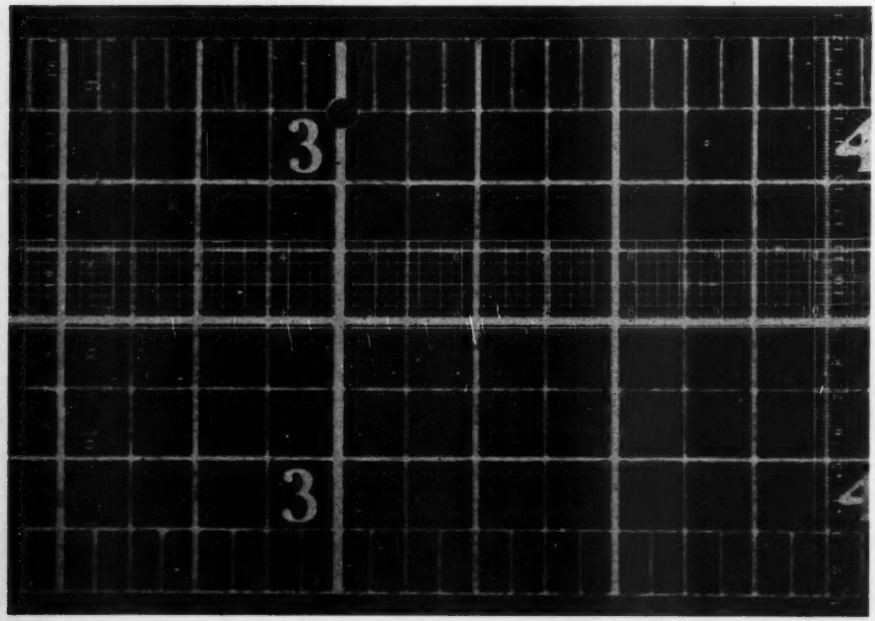
HOW, then, level the enlarger?

I have been utterly amazed to read, again and again, how levels are to be applied to the machine, how straight-edges are to be used, how plumb-bobs are to be festooned here and there until the scientific instrument looks like a Christmas tree. The machine itself is a precision apparatus, and can accomplish the task of leveling itself with an accuracy which straight-edges cannot approach. Let us therefore use the light rays which the enlarger produces to make its installation true by purely optical means.*

Set the enlarger head at any convenient height, a foot or two feet above the paper. Place a length of celluloid ruler in the negative holder. Turn on the lamp and focus the image sharply: the image is so greatly magnified that the printed numbers show rough edges, and focusing is easy. Now measure the width of the ruler as shown at the top and the bottom of the image. Measure carefully. Remove the

*Both the testing system and its mathematical proof are original with the present writer.

CELLULOID RULER enlarged about 6½ diameters by machine which is out of true. The ruler width at the top (left) is 2 m.m less than at the bottom (right). If the machine were properly installed, top and bottom widths would be identical.



negative holder, insert it the other way around, and measure again. Remove the ruler, turn it through 90 degrees, and measure a third time.

If the width of the ruler image, as measured in the three projections, is always the same, the system of the enlarging machine is true and it is installed at an exact right-angle to the base on which the image appears. If the widths vary, and are not identical at the tops and bottoms of the projections, either the edges of the ruler are not parallel (a rare defect which is shown up at once when the negative holder is reversed), the installation is wrong, the machine is out of true, or the lens is sadly defective.

It is not necessary to print an illustration showing the appearance of the ruler-image when all adjustments are correct, but Figure 5 shows what will be found when there is a small error. In this instance it is so small that ordinary mechanical devices cannot measure it even when they detect it, but our precision optical leveler, the enlarger itself, shows it up mercilessly.

The top width is clearly less than the base width, and it is not the fault of the ruler, for the results are identical when the ruler is reversed. Were the error larger, we would see that the angles at the top are greater than 90 degrees and those at the bottom less. We should recognize elongation below the center and compression above it; but these details, which will be vital when we discuss distortion control, are not important in our test, and we need not deal with them now.

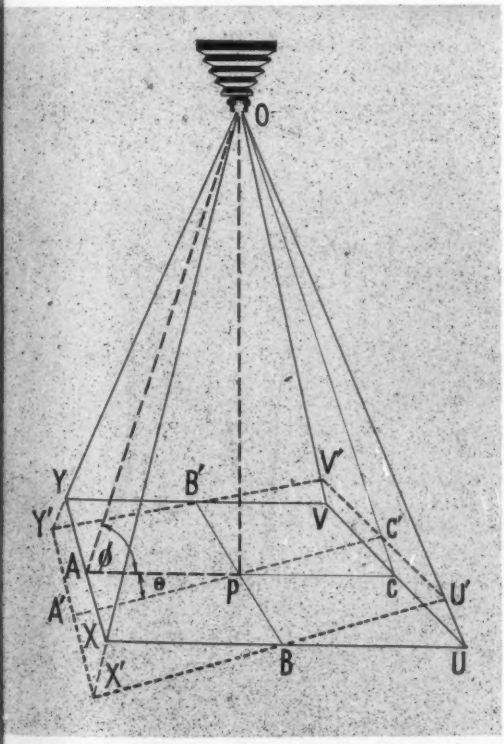
If no celluloid ruler is handy, an ordinary negative carrier fitted with a machine-cut mask to take 35 mm. film may be used for the test; where there is error opposite sides will not have the same lengths.

The most frequently found defect is a tilt toward the base. Enlargers are necessarily heavy, and the wooden platforms on which they are mounted are compressible. A machine which was true when bought may begin to lean forward in a year or two—therefore all such instruments should be retested at intervals, particularly as the entire test can be completed in a few minutes.

The remedies which are in order will suggest themselves. Shims may need to be inserted between the metallic base and the wood to which it is screwed or bolted. Liberties should *not* be taken with gears. Occasionally a bad error is caused by an improperly mounted lens-flange, or by a lens board which is thicker at one end than at the other, or by a lens which has been screwed in cross-threaded. Any error can easily be detected, and all of them can be distinguished from each other.

It will interest readers who are mathematically inclined to know that formulas correlating image distortion with angular error can be readily calculated. For their benefit a diagram and the applicable

(*Continued on page* 78)



DRAWING illustrates mathematical formula, page 78.

ONE NEGATIVE
did the job

Helen of Troy was all things to all men, but here is an idea that will permit one negative to be all things to any photographer who cares to play

THE MASK. Look out or someone else may wear your face.

By BALKIN: PHOTOS FROM MONKMEYER

IF YOU ARE looking for a few evenings entertainment in your darkroom, try these ideas.

Make a dark, contrasty print. Cut off the hair and body as shown, leaving just the face and part of the neck. If you have a pedestal for a plaster bust, fine; photograph it against a light background. If you haven't a pedestal, a table will do. Paste the "mask" on the picture of the pedestal and re-photograph it.

You can begin now to develop your talent as an artist. Make an underexposed print and trace the contour of the face, neck, shoulders, eyes, eyebrows, mouth, nose, ears and hair with India ink or a drawing pencil. In 1807 the most accurate way of reproducing an image was by tracing it with Wollaston's "camera lucida". Fox Talbot was using this "camera" when he struck upon the idea of photography. Details were given in the July issue of MINICAM in the article "In the Beginning," which was the first in a series about our photographic cultural heritage.

If you have an antique Byzantine painting in the attic (one from a book will do), re-photograph it, paste on the head of your portrait and go to work with a brush and some black paint or India ink. Presto! An enamel painting. (Our model being a blonde, didn't look authentic so we gave her hair a coat of black paint.)

A dark print of the face is necessary for the oil painting. Tipping the head down will create that "Mater Dolorosa" look. By "dodging," blacken the background so that only the face is visible. Make a photograph of a frame and print it in proportion to the portrait. Cut the frame out and paste it around the portrait. Then make a copy of the entire picture and frame.

After following these suggestions try a few ideas of your own.

HAVE YOU wanted to be an artist? Here's a way to "sketch" cousin Sue, and whether you are an artist or not, you can do it.

AN ANTIQUE byzantine enamel painting, made with a little paste, some Indian Ink and a portrait negative. Do you recognize her? The hair and eyebrows were blacked in with India Ink so as to be in the spirit of the painting.

THE ORIGINAL portrait unretouched, which was the skeleton for the job.

A FRAME, some dodging, tilting, masking, and presto—an oil painting.

RELATIVE SHUTTER SPEEDS AND LENS OPENINGS

1/1000	1/800	1/500	1/400	1/250	1/200	1/120	1/100	1/60	1/50	1/30	1/25	1/15	1/10	1/8	1/5	1/4	1/3	1/2	2/3	1
f 5.6	f 6.3	f 8	f 9	f11	f12.5	f16	f18	f22	f25	f32	f36									
f 4.5	f 5.6	f 6.3	f 8	f 9	f11	f12.5	f16	f18	f22	f25	f32	f36								
f 4	f 4.5	f 5.6	f 6.3	f 8	f 9	f11	f12.5	f16	f18	f22	f25	f32	f36							
f 3.2	f 4	f 4.5	f 5.6	f 6.3	f 8	f 9	f11	f12.5	f16	f18	f22	f25	f32	f36						
f 2.8	f 3.2	f 4	f 4.5	f 5.6	f 6.3	f 8	f 9	f11	f12.5	f16	f18	f22	f25	f32	f36					
f 2.2	f 2.8	f 3.2	f 4	f 4.5	f 5.6	f 6.3	f 8	f 9	f11	f12.5	f16	f18	f22	f25	f32	f36				
f 1.9	f 2.2	f 2.8	f 3.2	f 4	f 4.5	f 5.6	f 6.3	f 8	f 9	f11	f12.5	f16	f18	f22	f25	f32	f36			
	f 1.9	f 2.2	f 2.8	f 3.2	f 4	f 4.5	f 5.6	f 6.3	f 8	f 9	f11	f12.5	f16	f18	f22	f25	f32	f36		
		f 1.9	f 2.2	f 2.8	f 3.2	f 4	f 4.5	f 5.6	f 6.3	f 8	f 9	f11	f12.5	f16	f18	f22	f25	f32	f36	
			f 1.9	f 2.2	f 2.8	f 3.2	f 4	f 4.5	f 5.6	f 6.3	f 8	f 9	f11	f12.5	f16	f18	f22	f25	f32	f36
				f 1.9	f 2.2	f 2.8	f 3.2	f 4	f 4.5	f 5.6	f 6.3	f 8	f 9	f11	f12.5	f16	f18	f22	f25	f32
					f 1.9	f 2.2	f 2.8	f 3.2	f 4	f 4.5	f 5.6	f 6.3	f 8	f 9	f11	f12.5	f16	f18	f22	f25
						f 1.9	f 2.2	f 2.8	f 3.2	f 4	f 4.5	f 5.6	f 6.3	f 8	f 9	f11	f12.5	f16	f18	f22
							f19	f 2.2	f 2.8	f 3.2	f 4	f 4.5	f 5.6	f 6.3	f 8	f 9	f11	f12.5	f16	f18
								f 1.9	f 2.2	f 2.8	f 3.2	f 4	f 4.5	f 5.6	f 6.3	f 8	f 9	f11	f12.5	f16
									f 1.9	f 2.2	f 2.8	f 3.2	f 4	f 4.5	f 5.6	f 6.3	f 8	f 9	f11	f12.5
										f 1.9	f 2.2	f 2.8	f 3.2	f 4	f 4.5	f 5.6	f 6.3	f 8	f 9	f11
											f 1.9	f 2.2	f 2.8	f 3.2	f 4	f 4.5	f 5.6	f 6.3	f 8	f 9

THE TOP, horizontal row shows shutter speeds; the other numbers are all lens apertures. Each column, vertical or horizontal, represents one-half stop. To either double or halve an exposure, move two spaces. By consulting this table in conjunction with the markings on your camera, you can determine which calibrations represent full stops. When it is desired to change exposure one stop, it is necessary only to move either the shutter speed or lens opening one stop; or two spaces for two stops.

PHOTO DATA

CLIP SHEET FOR PERMANENT REFERENCE

MINICAM PHOTOGRAPHY

Outdoor Exposure

BASIC EXPOSURES

Working from a basic exposure, one can calculate mentally the exposure for most pictures, by allowing for the amount of light and the type of subject. The following calculations may be used as basic exposures, with normal action developers:

1/100 second and f/11 with films having a daylight rating of Weston one-hundred, i. e. Eastman Super-XX, Agfa Superpan Press and Ultra Speed Pan, and Du Pont Suprior Pan 3.

1/50 second and f/11 with films having a daylight rating of Weston fifty, i. e. Eastman, Plus-X and Verichrome, Agfa Superpan Supreme and Plenachrome, and Du Pont Superior Pan 2.

1/25 second and f/11 with films having a daylight rating of Weston twenty-four, i. e. Eastman Panatomic-X, Agfa Finopan, and Du Pont Superior Pan 1.

"YOUR GRASS IS GREENER" 1/150 f8 (film Weston 50)

VARIATIONS

The exposure should be halved by closing the lens one stop or doubling the speed of the shutter, in summer, or when photographing light colored objects, light foregrounds, or nearby people in snow, marine, or beach scenes. A basic exposure of 1/50 and f/11 could become either 1/100 and f/11, or 1/50 and f/16.

The exposure should be doubled by opening the lens one stop wider or halving the speed of the shutter in winter, or when photographing groups, dark objects, heavy foregrounds, or portraits. A basic exposure of 1/50 and f/11 could become either 1/25 and f/11, or 1/50 and f/8.

The exposure should be quadrupled when photographing subjects in the open shade or woodland scenes. A basic exposure of 1/50 and f/11 could become 1/200 and f/11 or 1/100 and f/16.

BREAKFAST 1/1250 f2.8 (film Weston 50)

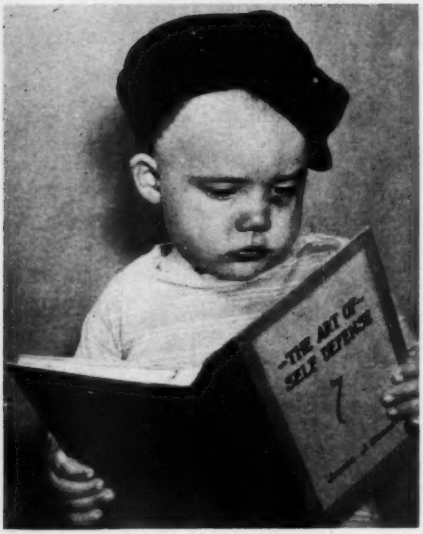
F NUMBERS

An "f" number is the opening, or aperture, of the diaphragm, behind or between the elements of the lens. This determines how much of the lens will be open to transmit light. By opening the shutter of your camera, when it is not loaded, you can see that the smaller the "f" number, the larger the lens aperture. (Of course, with a larger aperture more light can pass and more exposure will be given.)

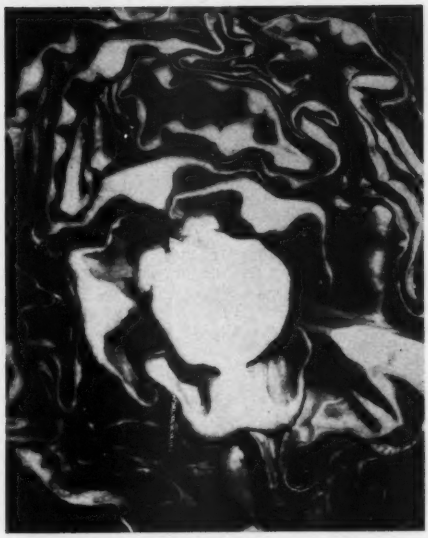
With a smaller "f" number, a greater depth will be in focus. If you are taking a picture such as "Australian Cattle" and want the foreground and background in focus, it will be necessary to use a small aperture. If you are taking a picture such as "Breakfast" and want to stop the motion, but don't need depth of field, a fast shutter speed would be advisable with a large aperture.

AUSTRIALIAN CATTLE 1/25 f16 (film Weston 100)

Our Readers snapped these



"TOO BAD this little fellow didn't read the book first. Well, now he can protect the other eye," says Paul J. Allen.—*Photo-Marketers.*



"STUDY IN RED CABBAGE" by Herbert Matter resembles a photogram. The Victory Garden Harvest brings many new subjects.

DID YOU KNOW that Fiorello H. La Guardia is a band leader? At a Red Cross benefit, he directed the Policemen and Firemen's band. From Max Peter Haas.—*European.*

RONNY JACQUES walked in and caught this Ontario Farm Service Girl getting ready for a days work. In Canada, thousands of college girls worked to bring in the harvest.

Anti-Aircraft Gunfire, North Africa

Official U. S. Army Signal Corps Photograph.

From the GRAFLEX brochure of

26 GREAT WAR PHOTOGRAPHS

GRAFLEX gets great pictures . . . reproduced here is one of the truly great pictures to come out of this war. It is GRAFLEX-made. Today, many former civilian camera men who used GRAFLEX-made cameras are handling war assignments with similar equipment.

On the home front GRAFLEX gets great pictures too. And to keep your GRAFLEX-made cameras in top picture-taking condition we offer a special service—the GRAFLEX *Customized* reNEWal Plan. Through your GRAFLEX Dealer you can arrange for an expert factory check-up and reconditioning. Talk to him about it. GRAFLEX also maintains a nominal amount of loan equipment for use while yours is being reNEWed by our plant craftsmen.

Visit GRAFLEX Information Centers

Ready to serve both military and civilian users of GRAFLEX-made equipment—GRAFLEX Information Centers are located at 50 Rockefeller Plaza, New York, and 3045 Wilshire Blvd., Los Angeles.

Official U. S. Navy Photograph.

26 GREAT WAR PHOTOGRAPHS

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Great Army Air Forces, Navy, Signal Corps and Marine Corps photographs . . . beautifully reproduced in an attractive brochure. Get your *free* copy at your GRAFLEX Dealer's or send 10c in coin or stamps to cover postage-handling. Dept. MC943, THE FOLMER GRAFLEX CORPORATION, ROCHESTER 8, N. Y., U. S. A.

GRAFLEX

In Focus

(*Continued from page* 12)

A Fine Photographer Speaks Up

Sir:

You can take the ¼ oz. of Gold Chloride and dissolve it in 16 oz. of distilled water which you use as a *stock* solution. Your working formula should be as follows—

15 grains Thiocarbomide dissolved in 10 oz. distilled water.
Add 2 oz. stock Gold solution while stirring rapidly.
Add to this solution 15 to 20 drops Sulphuric acid.
Add 12 oz. distilled water.

This gives you 24 oz. of toner which is enough for toning 2-16x20 prints which are placed back to back in your toning tray. This being enough, for you have to keep rocking your tray all the time during toning.

If you like to work with more solution in your tray you can add 10 oz. distilled water which makes the toner work much slower, and does not give as rich a blue. For this reason I use my toner rather strong.

Some formulas call for a stock solution of thiocarbomide but I don't like this, for this has a tendency to stain the white a pale yellow when the solution gets a little old.

I have received your request regards to an article. I am not much of a writer but I have this to say to others for improving their print quality.

The measure of a photographer's success is his prints. He may make the best negatives possible and arrange his composition perfectly, but if he does not produce good prints, he is not a good photographer and his prints will never achieve prominence.

First you must decide whether you want to puddle around in your darkroom experimenting with every new formula and gadget presented, or follow the direction sheet that is inclosed in every package of film and paper.

Rest assured—that the manufacturer of your film and paper had your and his interest at heart when the instruction sheet was inclosed. It is the greatest desire and most ardent hope of the manufacturer to have you make the finest negatives and prints his supplies can produce, and he has spent thousands of dollars in research to design a developer and a developing procedure which will give you that negative or print. Do you think you can improve on his laboratory findings in your converted coal bin or closet?

Make your choice of the film and paper you like, and use it as directed. Stick to the recommended procedure. Don't switch from developer to developer, and paper to paper, but give one combination a chance to prove its worth.

Another reason for mediocre prints is the popular delusion that fine cameras make fine pictures. It is difficult to find a photographer who does not feel that when he is able to afford that better camera, he will be able to make some real pictures: We magnify the importance of camera, lens, film, paper, enlarger, developer, and what not, and forget that picture making is a craft, and good pictures are made by good craftsmen.

I would not minimize the advantage of good equipment, nor attempt to discredit the many contributions which science has made to photography, but the fact remains that most of our finest pictures are made by those who are not laboratory technicians and whose equipment is simple and far from the best.

It is evident then, that if we wish to improve the quality of our photographs we must develop the necessary craftsmanship to attain this goal. The quickest and surest way is to stick to one combination of camera, film, paper, and developer till we learn their full possibilities.

MICHAEL J. ROLL

Dearborn, Mich.

Cine Experimenters

Sir:

In the August 1942 issue, page 36, "Sorcerer's Apprentice"—*abstract designs make exciting home movies*—(also exciting reading) by Herman Weinberg, a considerable amount of reportage is devoted to the "synchromies" works of Mary Ellen Bute and Ted Nemeth, a passing remark of their relationship to an American experimental group called "Expanding Cinema", all well and most beautifully illustrated with photos.

Well, dog gone it, now you've gone and done it again. I mean to say at this late date I've got all excited and in high gear to do some creatives along those lines. Have been intending to complete something similar in thought for the last three years, so you can imagine that when I first made Miss Ellen's and Mr. Nemeth's acquaintance in your June 1940 issue, page 109, "Cine Abstractions", I almost vibrated right out of my skin. The benefits that I have enjoyed from my own work to date is just enough to allow me, through my experiences, to enjoy the greater work of others.

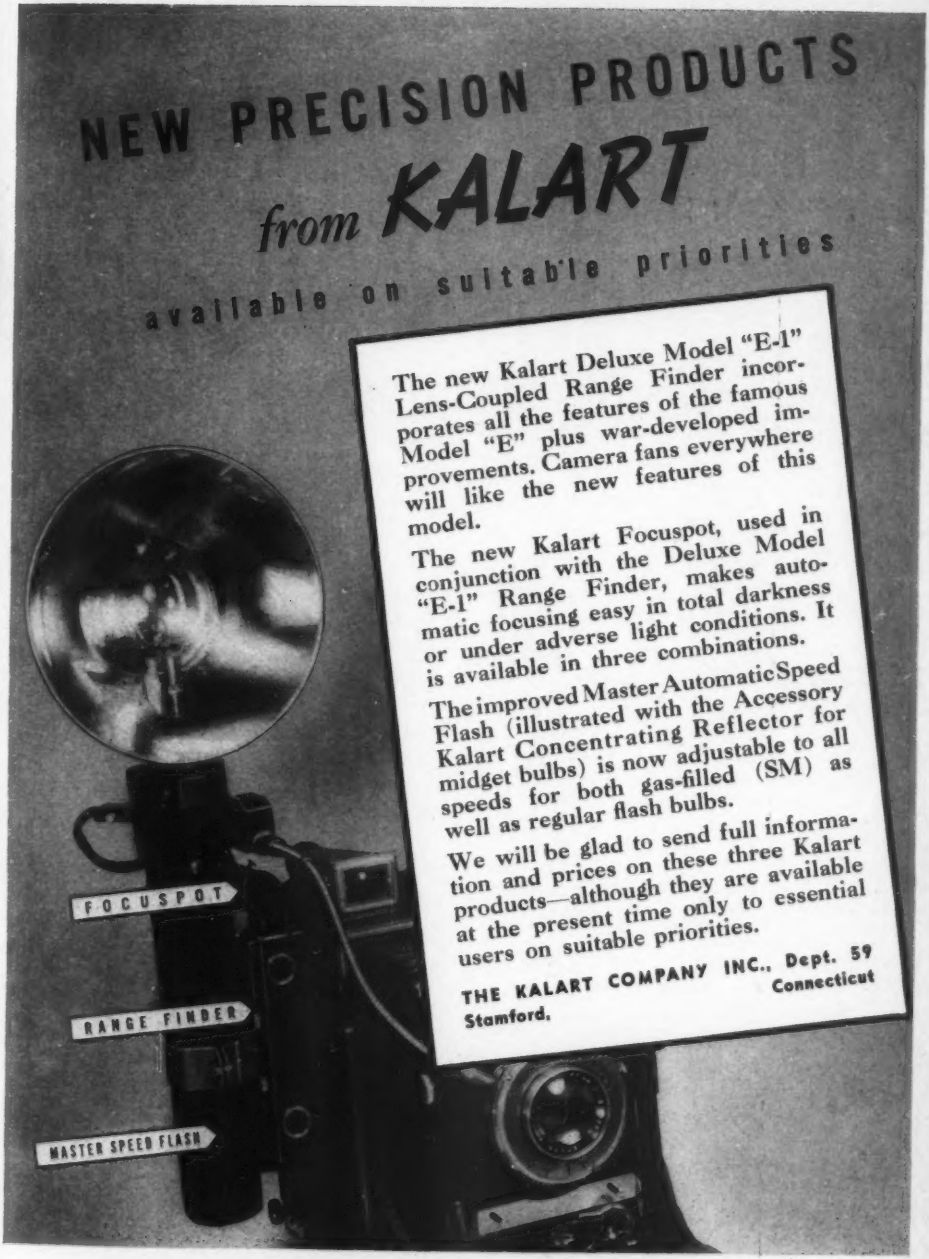
How can I get more information on this "Expanding Cinema" group and Miss Ellen and Mr. Nemeth and kindred cine souls? I don't know what the level of the pitch of these kind of rare articles are or is, but if it is a very small minority (judging from the infrequencies of these articles we must indeed be quite a small minority), also would appreciate any other information of other experimenters along similar lines. Don't refer me to Maholy-Nagy. I've investigated there already.

B. Jacque

1152 N. La Salle St.,
Chicago, Ill.

• If you will write to the Ted Nemeth Studios at 729 Seventh Avenue, New York City, Mr. Nemeth will notify you as to who distributes his and Mary Ellen Bute's films. They will also give you whatever information you might require, as would also Hans Richter, at 134 East 60th St. in New York City. Mr. Richter is one of the pioneer cine-experimentors in Europe. —H.G.W.

NEW PRECISION PRODUCTS
from KALART
available on suitable priorities



The new Kalart Deluxe Model "E-1" Lens-Coupled Range Finder incorporates all the features of the famous Model "E" plus war-developed improvements. Camera fans everywhere will like the new features of this model.

The new Kalart Focuspot, used in conjunction with the Deluxe Model "E-1" Range Finder, makes automatic focusing easy in total darkness or under adverse light conditions. It is available in three combinations.

The improved Master Automatic Speed Flash (illustrated with the Accessory Kalart Concentrating Reflector for midget bulbs) is now adjustable to all speeds for both gas-filled (SM) as well as regular flash bulbs.

We will be glad to send full information and prices on these three Kalart products—although they are available at the present time only to essential users on suitable priorities.

THE KALART COMPANY INC., Dept. 59
Stamford, Connecticut

BUY MORE U. S. WAR BONDS AND STAMPS

SALONS AND EXHIBITS

★ Follows P.S.A. Recommended Practices

Closing Date	Name of Salon	For Entry Blank, Write to	Number of Prints and Entry Fee		Dates Open to Public
Exhibit to see	Second Chicago International Photographic Salon.				Chicago Historical Society Bldg., Lincoln Park, June 1-Sept. 7
Exhibit to see	Annual International Salon of Muncie Camera Club.				Muncie, Ind., Camera Club, Aug. 1-6
Exhibit to see	Exhibition of 50 Years of Aerial Photography.				American Museum of Photography, 338 S. 15th St., Philadephia, Pa. August and September
Exhibit to see	★Fifty-second Toronto International Salon.				Eaton's Fine Art Galleries, Toronto, Can. Sept. 13-25
Exhibit to see	First International Photographic Exhibit, Field Museum of Natural History.				Field Museum of Natural History, Chicago, Ill., Sept. 15-Nov. 15
Exhibit to see	Second Annual Salon of German Shepherd Dog Photography.				Von Lengerke & Antoine, Chicago, Sept. 5-11 Marshall Field & Company, Chicago, Oct. 4-18
Exhibit to see	P.S.A. 100 Print Traveling Salon.				Pasadena Public Library, Pasadena, Calif., Oct. 1-30
Exhibit to see	27th Annual International Salon of Photography				Los Angeles County Museum, Exposition Park, Los Angeles, Calif., Jan. 1-31, 1944
Exhibit to see	London Salon of Photography.				Galleries of The Royal Society of Painters in Water Colours, 26-27, Conduit Street New Bond St, London, W.1.
September 18	Fifth Annual Salon of Photography of The Lens Camera Club of Chicago.	Salon Director, Lens Camera Club, Parkway Community Center, 5120 South Parkway, Chicago, Ill.	4	$1.00	South Side Community Art Center, 3831 South Michigan Ave., Chicago, Ill. Oct. 3-31
September 18	Eighteenth Annual Salon of Photography, Museum of Fine Arts of Houston.	The Salon Jury, Museum of Fine Arts of Houston, Main and Montrose Blvd., Houston, Texas.	4	$1.00	Museum of Fine Arts of Houston, Main and Montrose Blvd., Houston, Texas, Oct. 3-17
September 25	Third Annual International Salon of the Victoria Photographic Association.	Dick Colby, Room 4, 640 Fort Street, Victoria, B. C.	4	$1.00	Empress Hotel, Victoria, B. C. Oct. 22-Nov. 7
September 26	★Fourth Annual North American Salon.	Viola Haug, Sec., 1601 41st Street, Sacramento (16), Calif.	4	$1.00	Sierra Camera Club, E. B. Crocker Art Gallery, Sacramento, Calif., Oct. 3-30
September 26	★Fifth Atlanta National Salon of Photography.	Mrs. Mary Ruth Bird, 685 E. Morningside Drive, N. E., Atlanta, Ga.	4	$1.00	Atlanta Camera Club, Oct. 15-31

PHOTO BY U. S. ARMY SIGNAL CORPS

Photography mirrors an America worth fighting for

A Defender advertisement dedicated to one of the Freedoms for which America fights . . . and which American photographers have recorded so often with their cameras.

Tony's pushcart was almost a landmark down on the corner . . . Tony, who was always ready to talk, and who had his own opinions on how things should be run. The picture you took of him and the officer on the beat had just about everything a good picture should have . . . and you gave it the best possible break by printing it on a Defender paper.

Today, Tony himself would look at it and see far more than just a good picture. He has two sons who are fighting to preserve the right of free speech that picture expresses so well. And Tony knows that nowhere in the world, but in a free country such as this of ours, would he have that privilege . . . to stand up and talk . . . to criticize . . . without fear.

Defender

DEFENDER PHOTO SUPPLY CO. • ROCHESTER 3, N. Y.

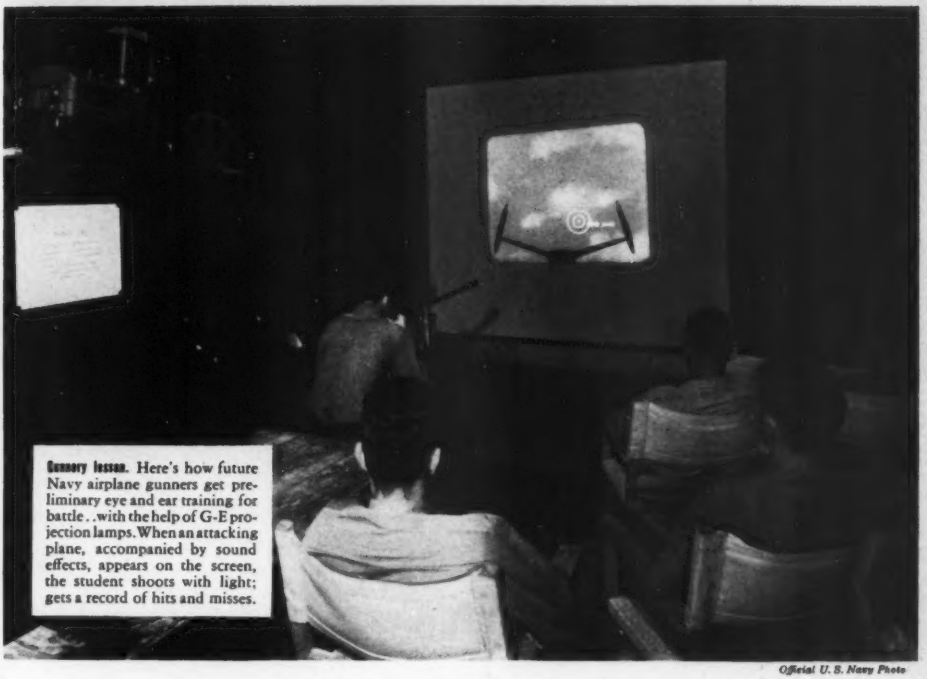
SALONS AND EXHIBITS

★ Follows P.S.A. Recommended Practices

Closing Date	Name of Salon	For Entry Blank, Write to	Number of Prints and Entry Fee		Dates Open to Public
September 30	★P. S. A. 1943 International Exhibition of Pictorial Photography.	Photographic Society of America, Franklin Institute, Philadelphia 3, Pa.			De Young Art Museum, Golden Gate Park San Francisco, Calif., Oct. 25-Nov. 13
September 30	Second International and Ninth Western Canadian Salon of Photography.	Donald N. Smith, Forest Insect Laboratory, University of Manitoba, Winnipeg, Manitoba, Canada.	4	$1.00	Oct. 9-22
October 1	★Fourth Annual International Vancouver Salon of Pictorial Photography.	J. Crookall, 3746 Eton Street, Vancouver, B. C., Canada.	4	$1.00	Vancouver Art Gallery, 1145 West Georgia St., Vancouver, B. C., Canada, Oct. 22-Nov. 11
October 1	Exhibition of Photographs of Greece.	Greek War Relief Association, 730 Fifth Ave., New York, N. Y.			Metropolitan Museum of Art, 82nd Street at Fifth Avenue, New York, N. Y., Nov. 1-30
October 25	★Columbus 1943 Salon of Photography.	Fred H. Braunlin, Chairman, Salon Committee, 456 Elsmere Street, Columbus 6, Ohio.	4	$1.00	
November 9	11th International Salon, 1943-1944, of the Pictorial Photographers of America.	John H. Jockwig, Salon Secretary, 715 E. 226th Street, New York, N. Y.	4	$1.00	American Museum of Natural History, Central Park West and 79th Street, New York, N. Y. Dec. 13-Jan. 2
November 11	1943 New York Salon of Photography.	Barbara Green, Director, 121 W. 68th Street, New York, N. Y.			Nov. 27-Dec. 12
December 7	★Sixth Annual Springfield International Salon of Photography.	Salon Secretary, The George Walter Vincent Smith Art Gallery, Springfield, Mass.	4	$1.00	The George Walter Vincent Smith Art Gallery, Springfield, Mass., Jan. 5-26, 1944

SEPTEMBER CONTEST CALENDAR

Open to	Subjects	Prizes	For copy of rules, write to	Closing date
Amateurs	Photographs must dramatize some phase of our civilian war effort.	$500 War Bonds Awarded every month.	Victory Photo Contest, Victory House, Pershing Sq., Los Angeles, California.	Last day each month.
Amateurs	Any.	$25 in awards, including three $5 prizes weekly.	Camera Contest Editor, Chicago Herald American, 326 W. Madison St., Chicago, Ill.	Weekly
Amateurs	Any. Award based on subject interest and initial impact.	$10, $5, $4, $3.	Mechanix Illustrated, 1501 Broadway, N.Y.C.	24th of each month.
Press Photographers	Pictures in which cigars play a news-worthy part and which were taken in course of regular duties and published.	$50, $25, 5 awards of $20, 5 awards of $10 and extra awards for special merit.	Photo Judges, Cigar Institute of America, Inc., 630 5th Ave., New York, N. Y.	Sept. 30th and Dec. 31st
Any	Gadget Contest. Prizes awarded to those who submit the most novel and useful ideas as to how they have used or what they have made with the Edmund Chipped Edge Lenses.	$25 War Bond, $10, $5, 10 honorable mentions, consisting of choice of ten lenses listed on Edmund's general price list.	No entry fee or form necessary. Send entries to Edmund Salvage Co., 41 W. Clinton Ave., P. O. Audubon, N. J.	September 31
Any	Photographs of heavy, dormant industrial scrap collections.	$50 War Bond, $10, $5 and $1 in War Stamps.	Business Press Industrial Scrap Committee, 50 Rockefeller Plaza, New York, N. Y.	October 31st



Gunnery lesson. Here's how future Navy airplane gunners get preliminary eye and ear training for battle . . with the help of G-E projection lamps. When an attacking plane, accompanied by sound effects, appears on the screen, the student shoots with light; gets a record of hits and misses.

Official U. S. Navy Photo

How the G-E Photo lamps you've given up help cram years into months

WHY is it that you can no longer buy G-E photo lamps . . . unless you have a priority rating of AA-4 or higher?

Of course it's a WPB ruling. But behind that are many wartime needs that you may not have appreciated.

You know that the armed forces are making extensive use of flash bulbs. Likewise it is important to conserve critical materials.

But G-E lamp bulbs are also helping the Services in other vital ways. For example, thru their use in taking and projecting training slide films and movies they're helping our men in the armed forces learn their new jobs faster and better. Actually they help make it possible to cram years of officer training into months.

And G-E lamps are doing many another war job, too. Obviously, each lamp we make for this work means less material available for other lamps . . . another reason for the sacrifice asked of you in lamps for your photography.

If you are an essential flash user, at least an AA-4 priority, you can help conserve materials and transportation by switching to G-E Midgets on many a shot. They use less material and less space. And you'll find they're good for over 95% of flash bulb needs.

Hear the General Electric radio programs: "The Hour of Charm", Sunday, 10 p. m. EWT, NBC; "The World Today"-news, weekdays, 6:45 p. m. EWT, CBS.

G-E MAZDA PHOTOFLASH LAMPS

GENERAL ELECTRIC

INVEST IN YOUR COUNTRY'S FUTURE...WHY NOT BUY AN EXTRA WAR BOND THIS MONTH?

In the "HEART" of Summer

THESE TWO AIDS WILL GREATLY ENHANCE THE APPEARANCE OF YOUR PRINTS AND NEGATIVES!

RETOUCH-ALL KIT

The complete dye-retouching kit for prints and negatives . . . general or local bleaching . . . masking for vignetting or complete or partial background removal. Eliminates the old-fashioned methods of pencil retouching . . . gives you cleaner, smoother, more beautiful and lasting job. *No experience necessary to work with RETOUCH-ALL* . . . just wet your brush and begin!

1-oz. Concentrated Blue-Black Retouching Dye
1-oz. Concentrated Warm-Black Retouching Dye
1-oz. Concentrated Sepia Retouching Dye
1-oz. Wondrop Concentrated Wetting Agent
1-oz. Correctol • 1-oz. Masking Fluid
12 Lintless Blotters, Brush, Cotton Sticks, Dropper

ALL FOR $3.50

Plus—FREE—a copy of the brand new booklet, "Manual of Dye Retouching," by A. J. Lockrey. Contains complete information about the remarkable new method of "retouching with dye" in all its phases. The material contained in this book alone is worth practically the purchase price of the entire RETOUCH-ALL KIT.

WONDROP

. . an aid to summer photography

When summer humidity is high, the film dries more slowly than usual, many times causing stains, water spots, excessive grain. WONDROP cuts drying time by 50%, thus reducing the possibility of grain-y negatives. WONDROP is the concentrated wetting agent for all photographic solutions and operations dealing with fixing, toning, reducing, intensifying, coloring, opaquing, spotting and retouching. Use just one drop for each 8 ounces of solution. 60¢ for 2 fluid ounces, or 1000 drops. $1.00 for 4-oz. bottle.

At your dealer's or order direct

AMERICAN BOLEX CO., INC.
155 East 44th Street • New York City

TECHNIQUE IN ENLARGING

(*Continued from page* 65)

equations are printed below.

In the diagram, XYVU represents the rectangle projected by a true optical system, and X'Y'V'U' the false projection when the system is inclined to its base.

By construction, the angle $\overline{OA'}P = \Phi - \Theta$
and the angle $\overline{OC'}P = \Phi + \Theta$

In the oblique triangle A'OP, $\frac{A'O}{\sin(90°+\Theta)} = \frac{OP}{\sin(\Phi-\Theta)}$

and as $\sin(90°+\Theta) = \cos\Theta$, $A'O = \frac{OP\cos\Theta}{\sin(\Phi-\Theta)}$ (1)

In the right triangle AOP, $\sin\Phi = \frac{OP}{AO}$, hence $AO = \frac{OP}{\sin\Phi}$ (2)

Dividing (1) by (2), $\frac{A'O}{AO} = \frac{OP\cos\Theta\sin\Phi}{\sin(\Phi-\Theta)\,OP} = \frac{\cos\Theta\sin\Phi}{\sin(\Phi-\Theta)}$ (3)

and as $\frac{X'Y'}{XY} = \frac{A'O}{AO}$, $X'Y' = \frac{XY\cos\Theta\sin\Phi}{\sin(\Phi-\Theta)}$ (4)

Similarly it can be shown that $U'V' = \frac{UV\cos\Theta\sin\Phi}{\sin(\Phi+\Theta)}$ (5)

If we now divide (4) by (5), and cancel out XY and UV, which are equal, we shall have $\frac{X'Y'}{U'V'} = \frac{\sin(\Phi+\Theta)}{\sin(\Phi-\Theta)}$ (6)

which may be suggested as a fundamental formula good for all values of Θ.

We may now apply the formula to Figure 5. When making the print, AO was 23 inches, while the print itself shows that AP is 4.5 inches. AP/AO=4.5/23, and the tables tell us that this is the cosine of 78°42'30"=Φ. We must be more exact than is possible with the two metric celluloid rules shown in the print, and a precision rule reads top and bottom widths as 161.5 and 159.5 m.m. In actual practice, readings would be taken from the projection, without making a print.

We put log. 161.5 =2.20817
and log. 159.5 =2.20412
and the log. of the ratio =0.00541=1.0125
Now log. sin 78°42'30" =9.99151, and we find in the tables
log. sin 80°27'30" =9.99395
and log. sin 76°57'30" =9.98865
The log. of the ratio =0.00530, which is near enough,

and we determine the unknown angle of error as Θ=1°45'. With equal ease the formula may be worked backwards, so that having intentionally set the system to a tilt, we may calculate the resultant distortion.

Finally it should be noted that any lens may be used for making the test projection. While the scale of reproduction will change, the proportions will not vary unless the distance between the lens and the base is altered.

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Book Reviews

MAKING A PHOTOGRAPH. By Ansel Adams. Published in England by The Studio Limited. American agents: The Studio Publications, 381 Fourth Avenue, New York City. Price $3.50.

The book "Making a Photograph" is an introduction to photography, giving exactly what one needs to know to make a photograph, from the time the idea hits until the print is completed. Mr. Adams feels that "extravagance is unnecessary; simplicity and precision are essential." He has selected equipment that he believes is "a reasonable balance between efficiency and expense." Some of the subjects dealt with are equipment, materials, aesthetic considerations, composition, exposure, developing, printing, spotting; and types of photography, including landscape, portraiture, architectural, advertising, action, documentary and color. One section gives chemical formulas and tells how to mix them.

This book is part of the "how to do it" series of Studio Publications, and carries information given in a complete, but concise, understandable method. The author has supplied it with many of his own illustrations to add to the interest and bring out many important points. The 35 illustrations are "tipped in" and printed on a fine glazed stock.

There is a foreword by Edward Weston. In the introduction, Ansel Adams says:

"An impartial evaluation of the modern trend and achievement of photography would indicate that the medium has advanced to extraordinary perfection as a craft, but as a form of aesthetic expression it has matched the glowing accomplishment of the 1840's only in the work of a few exceptional creators. The inquiring spirit of the 1930's would certainly not dispute the first statement, but might be expected to challenge the second with some provocation. Nevertheless, a jewel was formed in the matrix of the early nineteenth century, indigenous to its period and sincere in the purity of its presentation. David Octavius Hill succeeded both in making remarkable photographs and in demonstrating one of the basic principles of art; complete expression within the limitations of the medium.

"The truly significant photography of the world, past and present, must be evaluated by this basic principle, not by any exotic tradition and prejudice or misinterpretation of the 'contemporary' viewpoint. The limitations of any medium of art are material and social as well as aesthetic. Hill worked with apparatus and materials which were extremely crude and restrictive in comparison with those of the present day. The subject matter of his work evidenced his rather formal, dignified, and self-conscious personal and cultural environment. As a document of a world nearly a century removed from us in time and thought, and as a thrilling example of intellectual and aesthetic mastery of

the art of photography, his work retains its primary importance.

"Following Hill's extraordinary application of the medium, we can trace the development of photography as an art through a multitude of individuals, movements and methods down to the present day. This development, however, is not entirely one of progress. There are intervals of obvious decadence. The essential honesty and directness of the medium were nullified by the romantic tendencies of the late nineteenth century, when photography turned to a shallow restatement of the qualities and intentions of the painting and other graphic media of that period. This 'romantic' aspect of photography is termed 'Pictorialism'. Pictorial photography is still popular, but the revival of interest in the purity of the medium—supported by a more universal directness of thought and the vast mechanical and technical advances—is now assuming precedence.

"The flood of Pictorialism did not obliterate the slender thread of communication between the integrity of the earlier years and its hopeful reanimation in the present. This thread, which continued the true identity of the art, was maintained with heroic devotion by Alfred Stieglitz more than by any other individual. Through his life-long efforts, photography has been vastly aided in the reassertion of its real quality and purpose. The photographic renaissance, anticipated by Stieglitz, has become a vital actuality in the last two decades.

"What is required above all else is a number of centralized institutions which combine competent instruction in theory and practice with library and museum features. Repositories of the most significant photography, past and contemporary, are sorely needed. The understanding of photography as a form of art implies much more than a knowledge of physics and chemistry and a superficial education in the aspects of painting and other media. It is necessary to study photography itself to interpret the medium in its own terms and within its own limitations."

In the early days of photography successful pictures were so rare that each time one was produced it was announced in flowery language in the newspapers as an event of great importance.

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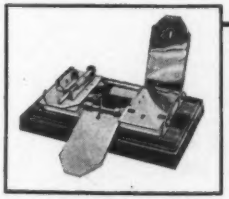

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Previews of Office of War Information Films

OFFICE OF WAR INFORMATION FILMS will be previewed one week of each month at the New York Museum of Science and Industry, R. C. A. Building, 30 Rockefeller Plaza, New York City.

Aldex—Quick Film Dryer

ALDEX, an insoluble vegetable fibre product, will remove the surface moisture from films, enabling rapid drying. (This product was on the market for a year on a trial basis under the name of Textilex).

Twelve sheets of Aldex 8½x10½ for drying cut film sell for 30 cents and a tube of five strips 5"x62" for drying roll film sells for 40 cents. It is made by the Aldine Paper Company, 373 Fourth Avenue, New York, N. Y.

Pocket Photographic Index

WILLOUGHBYS, 110 W. 32nd St., New York, N. Y., have published a Handy Photographic Index which measures 3½"x5" and sells for 65 cents. It contains information on the following: weights and measures, chemical formulas, film, paper, exposure, filters, movie cameras and projectors, slide projectors, conversion tables of film speeds, inches to millimeters, U. S. to F system, emergency coin weights, and exposure record labels.

Day Time Projection Unit

A NEW PROJECTION SCREEN unit is announced by the Radiant Manufacturing Corporation, 1140 W. Superior Street, Chicago, Illinois. The new item, called the Radiant Day-Time Projection Box, permits showing films or slides in broad daylight to groups up to 150 persons by means of a shadow box construction, and a 39"x52" glass beaded, brilliant "Hy-Flect" screen surface. It may be set up quickly and adjusted to four heights. All parts may be folded, to fit into a storage case. This new unit is especially valuable to training schools, hospitals, conventions, etc.

New Navy Gunnery Trainer

THE NAVY REVEALS that a Gunnery Trainer was invented by Lieutenant Commander D. L. Hibbard, U.S.N.R. Previously aerial gunners were trained on still targets.

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Federal Mfg. & Eng. Corp. Wins Second Army-Navy "E" Award

THE WORKERS OF FEDERAL MANUFACTURING and Engineering Corporation, 211 Steuben Street, Brooklyn, N. Y., have again won the Army-Navy Production Award for meritorious service on the production front. This second award is symbolized by a White Star which now takes its place on the "E" flag won by Federal workers more than six months ago.

"We have a big job to do", says David H. Engelson, President of the Company. "Final victory is now in sight. We must not be smug. We must produce more, faster. Those of us on the home front can materially shorten the war and bring the boys home more quickly if we double and redouble our efforts now. The men and women of the Federal Manufacturing and Engineering Corporation renew their pledge made six months ago . . . to surpass all their previous production records."

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CAMERA CLUB
NEWS AND IDEAS

FROM Pictorialism, to War, and back again: For years amateur Photographers have looked to Fraprie's "Annual" as a yardstick to measure Pictorialists, and rightfully so. He has contributed a lot of his time, and effort, to make his rating system a success. Has he developed a similar system to rate our Enemies??? (we refer to his prediction of the European War ending by December 1943).

GREEN BRIAR C. C. of Chi., didn't mind losing one of their best Pictorialists', to the War effort, (he works at "Amertorp" 7 days a week) but, when he spends what little spare time he has, dancing, that's adding insult to injury.

HARRY BONNER of Omaha, Nebraska, has just completed a 6 weeks course at the Ray School of Photography here in Chi. We are anxious to see the results in his future work this season, thru the Omaha C. C.

The members of the SACO & BIDDEFORD C. C. of Me., are "craming" on Photography, with MINICAM, and other periodicals, photographic books, etc.

AT THE UNIVERSITY of Penn. Photographic Society, Philadelphia, Pa., of a former membership of 85 (at the time of Pearl Harbor) only 6 remain, and these are receiving special training prior to entering the services. They have turned their darkroom over to the Navy-Pre-Flight boys for printing pictures to be used in their local Gremlin Gazette. Mr. Harlin G. Loomer (Faculty sponsor) not eligible for active service, does his bit as an instructor for Flight Navigation for the Navy.

Crowded, WASN'T it: With those 16 W. P. S. of Cleveland girls on that lone cab ride. Who rode in front of the driver??.

CONGRATULATIONS to Editor "Bob" Coon and his first issue of "The Exposure," official publication of the Akron C. C. of O. Their Foto Females column by Marian W. Tobias, affords their Fair Sex an opportunity to compete with the men in News, as well as pix.

A question, Rules for Studio, under rule No. 5, if they only *practice* under Chaperon, WHEN, do they start shooting in earnest??.

"CAMERA CLUB NEWS" bulletin of the Atlanta C. C. Ga., still continues as one of the best in our humble opinion. Their July cover, a reproduction of H. J. Phillips, F.R.P.S., A.P.S.A., *"Carolina Valley"* print, is excellent. Either this club is up in the bucks, or, Ledlie Conger is an ANGEL to his club. In their Editorial they point out that of 65 members, 24 have submitted one print or more in the monthly judging meetings, and 18 of this number have turned in more than a single print. At a discussion some one advanced the idea that the reason only a small portion of the membership participates in the Salons was due

60 percent to inertia, 25 percent to timidity, and only 15 percent to lack of skill.

THE SOLE purpose of the Central U.S.A. print Competition is to foster competition among clubs in neighboring States, thereby giving them an opportunity to measure the progress of their members in the field of Pictorial Photography.

Realizing the trying conditions under which most clubs are now operating, the Committee decided to limit the number of prints required. Instead of the previous 32 (8 months 4 prints each month) or 20 (5 months 4 prints each month) only 12 prints are needed. Since only 12 prints are required, even the smaller clubs may participate. We are more interested in Quality than Quantity.

We all know from experience that outside competition is the best incentive for your members to produce GOOD PRINTS.

This is POSITIVELY a non-profit undertaking. At the end of the season, each participating club will receive a STATEMENT, showing how the Entry Fees were used. As time goes on, and the contest becomes SELF-SUPPORTING we will INCREASE the PRIZES, both in QUANTITY, and QUALITY. For further information see (August issue of MINICAM) or write for a four-page illustrated prospectus to: Gaston Van, chairman, 3859 West Adams St., Chicago 24, Ill.

THE MANHATTAN Camera Club—Harvey Falk, President announces in Amacam following demonstrations and lectures at which guests are welcomed—310 Riverside Drive, New York City—June—Toning, Harvey Falk, July— Retouching the Negative, Part I—Helen Garfield, August—Retouching Negative, Part II—Helen

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Professional contact finishing. 8 Exposure roll developed and complete set of Super Professional prints. Print credit for poor exposures.

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BOSKO Cartoon Home Movies PACKED with Thrills

This little colored fellow is sometimes mischievous, or the hero of fantasy and ofttimes the victim of his own witting pranks, making him one of the most delightful characters to be seen in cartoon Home Movies. First BOSKO films available, offered in 50 ft. 8MM at $1.50, and 100 ft. 16MM at $3.00.

Bosko's Circus Fleas	1801-A
Bosko's Photo Finish	1802-A
Bosko's Bad Wolf	1803-A
Bosko's Bear Escape	1804-A
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Use several of the above in your next HOME MOVIE presentation. Include a thrilling Aviation film, and one or more MICKEY MOUSE, DONALD DUCK, THREE MONKEYS and OSWALD RABBIT Cartoons.

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Write for FREE catalog describing world's great
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MEDO PHOTO SUPPLY CORP.
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Garfield, September—Paper Negatives—Henry Cohen.

FOOTHILL Camera Club, Pasadena, California in a humorous article in Bellows suggest that many high-scoring Salon Prints be retired at end of a certain number of successful salon hangings and their makers be awarded a Distinguished Nuisance Medal, and in this way assure a better chance to all new prints.

NIAGARA CINEMA League, Pauline Miller, Secretary, 351 Auburn Avenue, Buffalo, N. Y., would like to correspond with other movie clubs to exchange ideas on programs, etc.

CENTURY CAMERA Club of Baltimore, Md., announces election of new officers—Ernest Schwartz, President, Edmund Neer, V-P, Walter Wettern, Treas., and Charles Briggeman, Secretary.

TWIN CITY Camera Clubs of St. Joseph and Benton Harbor, Michigan received 592 prints for their Ninth Annual Blossomtime Salon of Photography. This Salon, the first of nation wide scope ever held in Western Michigan is becoming increasingly popular.

THE PHOTO QUIZ Contest between Manhattan CC and Rockefeller Center CC was won by the former. Mrs. Mabel Scacheri, Mrs. Barabara Green and Williard D. Morgan were the judges. This is to be made an annual event with a cup donated by Dr. G. A. Leslie, one of the founders of Rockefeller Center CC.

THE SIXTH ANNUAL salon of Photography at the Fitchburg Art Center, Massachusetts, attracted 429 prints of which 130 were accepted. There were 106 entrants of which 69 were successful. Elsie M. Lowe was chairman.

"It must be a wonderful hobby. They all seem interested in photography."

GADGETS, KINKS AND SHORT CUTS

Ground Glass Labels

YOU CAN make ground glass labels on any of your chemical bottles with a carborundum stone which is sold at most dime or hardware stores. Rub the glass with the carborundum stone. Any rubbing motion is O.K. After grinding the surface to the desired area, wipe off with a small rag, and then throw the rag away, or send to Hirohito.

A rough stone will cut faster. For labeling, crayon is preferred to pencil, as different colors show up better on different colored bottles. Water and photographic chemicals will not affect the crayon, so the bottle may be washed without damaging the label. When another chemical is placed in the bottle, the first label may be erased. It is sometimes advisable to grind two labels to have a place for dates and records.—*C. M. Cox.*

Tripod Extension

TO PHOTOGRAPH subjects requiring additional height, attach a hand grip as supplied with some movie cameras. This should not interfere with a tilt top.—*J. K. Karlovic.*

Portraits When Least Expected

CAMERAS with permanently mounted flash trippers can be used very effectively when taking portraits. The battery case is connected to the tripper by an extension cord, and in this way the operator can take a picture while seemingly doing something else in preparation. A remote cord attached to focal plane outlets on battery case will accomplish the same result. Many people "freeze" when the photographer nears the camera in portraiture, and with this extension cord in the hands of the cameraman who may be some distance from the camera when the best expression appears on the subject's face, the shot can be made without running back to the camera and causing the subject to pose and lose naturalness of expression.—*Fred L. Tonne.*

MONEY talks...
Here is some stuff I've got to sell,
But I also BUY as well;
I pay THE price and never squawk,
I always let my money talk.
Charles Bass

GIVE THESE THE GLAD EYE

3¼x4¼ Curtis single mirror color camera, 15 mm. Carl Zeiss Tessar F:4.5 Compur, Kalart R.F. holders, like new	$197.50
Sept. camera, F:3.5 lens and case	$ 35.00
Super six-20 Kodak, built-in meter, R.F., F:3.5 lens, case	$167.50
3¼x4¼ Agfa View, 5" Wollensak F:6.3 in Alphax shutter, case, holder	$ 45.00
3¼x4¼ Series B R.B. Graflex, 6¼" Kodak F:4.5 lens, F.P.A.	$ 97.50
3¼x4¼ Series D Graflex 7½" Kodak F:4.5 lens	$127.50
5x7 R.B. Cycle Graphic with 7½" Protar VIIA convertible in Volute shutter, interchangeable 4½" Protar W.V. Series V lens, three holders, adapter and case	$120.00
3¼x4¼ Ensign folding reflex, Cooke Series II F:4.5	$ 62.50
9x12 cm. R.B. Ernemann Folding Reflex, F:4.5 lens, and F.P.A.	$ 55.00
19 7/16" Bausch & Lomb Tessar Series 1C F:4.5 in Iris diaphragm barrel	$265.00
5x7 Home Portrait Graflex, no lens, one holder	$ 97.50
Mercury, with Hexar F:2 lens, interchangeable 3" telephoto F:3.5, including extra cartridges, loader, finder	$ 87.50
16½" Goerz Berlin Dogmar F:5.5 in Iris diaphragm barrel	$165.00
4x5 BeeBee Enlarger, condenser model, complete less lens	$ 97.50
2¼x3¼ Leitz Vasex Enlarger, complete with F:4.5 lens	$107.50
2¼x3¼ recent model Solar Enlarger, F:4.5 lens	$ 42.50

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Contest Closes September 30th

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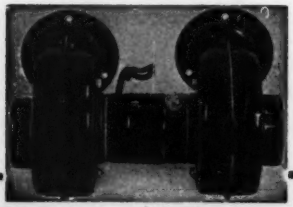
41 W. Clinton Ave., P. O. Audubon, N. J.



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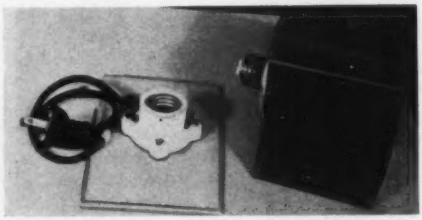
Single Unit Model, $9.95

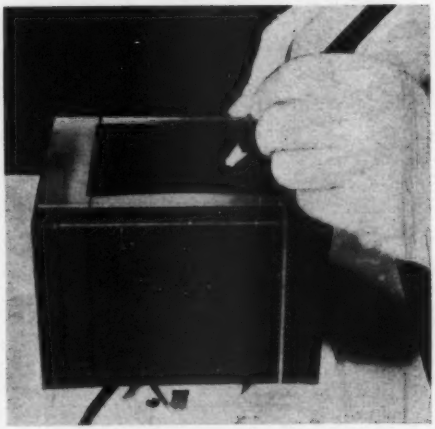
ELKAY PHOTO PRODUCTS, Inc.
7 Oliver Street, Newark, N. J.

Safelight Retouching Stand

THE TYPICAL BOX-LIKE SAFELIGHT found in most darkrooms, can be adapted to serve as a retouching easel, by putting a piece of ground or opal glass in place of the filter. If the filter cannot be removed, the glass may be held on top with rubber bands which can also be used to hold the negative (lower illustration).

The first illustration shows the safelight ready to be screwed into a socket which is mounted on a heavy wooden base.—*N. A. Gainen.*



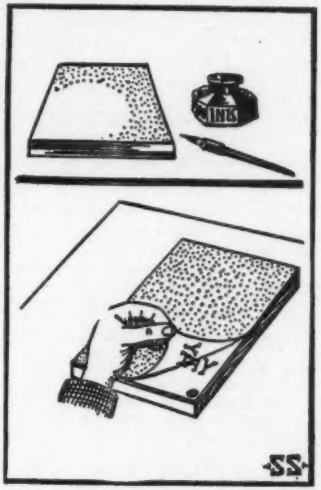


Emergency Photo Trimmer

THOSE WITHOUT A PHOTO TRIMMER find it difficult to get satisfactory edges. An ordinary sheet of plate glass slightly larger than the print will do this work. Simply place the glass on the print, using it as a straight edge to guide a razor blade. The operation can readily be observed through the glass and quick, accurate cuts can be made that might otherwise be impossible. An old magazine (not MINICAM, of course) placed underneath will keep the work from slipping and prevent damage to the table.—*A. Bognar.*

Duplicator From Exposed Film

AN EXPOSED FILM, slightly larger than the material to be copied, is soaked in water for a half hour. This is then thumb-tacked, emulsion side up, at the four corners to a board. The writing, drawing or announcements to be reproduced must be made with hectograph ink, which is available at stationery stores. Write with a clean steel pen on ordinary paper and permit this copy to dry thoroughly. The original is placed, writing side down, on the film, which should now be merely damp; wet spots must not appear on the surface. Rub the original with the palm of the hand to insure perfect contact and allow it to remain in this position for about a minute. Grasp the corner of the original and peel it off, as shown in the illustration.



For best results, slightly dampen the paper on which the copies are to be made and place it in contact with the original film as you did when making the first impression. Insure perfect contact as before, then peel off the copy. Dip each sheet of paper in water, remove instantly and pile one on top of the other. Twenty-five to fifty copies can be made from one impression. When finished using the improvised hectograph pad, wash the film with soap and water and set aside to dry. It will be impossible to remove all traces of writing from the negative, but the marks remaining will not interfere with its future use. The negatives can be used again with a new drawing after several days.—© *Science Service.*

Negative File Box

AN EFFICIENT FILING SYSTEM can be worked out for cut-film negatives by using the factory containers in which they are packed.

(*Continued on page* 91)

Fans fortunate enough to have bought a Federal Enlarger before we stopped making them in favor of war equipment, are still having a ton of fun with these famous darkroom instruments. You see, Federal Enlargers were built not only to produce salon-quality enlargements but also to "stand up" for years. Your dealer may have one or two in stock . . . why not stop by and ask?

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WILL PAY $26.00 for Weston Master in good condition. L. H. McDaniels, Pine Crest, Salisbury Center, New York.

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AGFA MEMO F3.5 double-frame camera, good shape; state condition, price. Empty cartridges. Box 200.

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EIGHT 2¼x3¼ Panatomic X film packs, 8 gross contact paper, $9.00. Richard Smoker, Goshen, Indiana.

MIN. SPEED GRAPHIC and its accessories. Devere Larson, Litchfield, Minn.

WESTON MASTER, sell best offer. Special Kodak R. F., $40. Acro F3.5 Velostigmat, $17. Graflex, no lens, $25. Ernemann 9x12 Tessar F4.5 complete, $60. Your roll camera adapted to take size desired. Levey's, 735 Noble, Bronx, N. Y.

CONTAX III, F1.5 LN, accessories, $399. Enlarger, $111. Want Rolleiflex. Attorney Goldberg, 410 Asylum, Hartford 3, Conn.

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$1 BRINGS "Surprise" assortment 8mm colorful titles! Guaranteed. LeMoine Films, 926 West Austin St., Nevada, Mo.

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ENLARGER—Build your own enlarger from kit of parts we furnish and save real money; $6.00 post paid. Particulars free. Crescent Engineering, Box 251, South Pasadena, California.

BEAUTIFUL KODACHROME SLIDE and list, 25c. Art Slide Co., R-1, Canton, Ohio.

THRILLING, SENSATIONAL Mexican, Cuban, Art Pictures, Books, Miscellaneous. Samples. Lists—50 cents. Jordan, 135-T Brighton St., Boston, Mass.

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REPRODUCE any snapshot on hankies, slips, wood, leather, etc. Outfit $1.00; no stamps. DISSELL CO., 4667 Rockwood Rd., Cleveland, Ohio.

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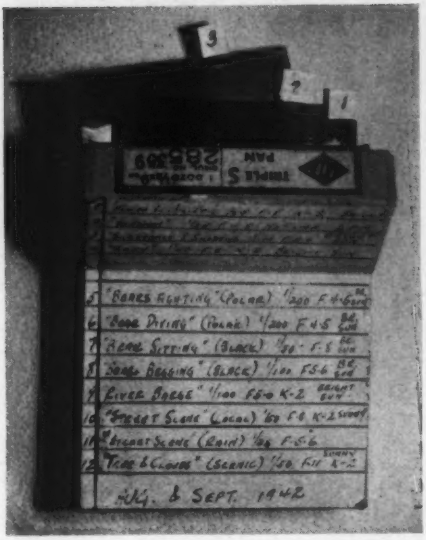
9x12 RECOMAR F4.5, holders, adapter, case, for good miniature or roll-film camera. R. M. Jefferson, 35 N. Alvord Blvd., Evansville, Ind.

DEVELOPING—PRINTING—REPAIRING

35MM FANS—See our display advertisement on page 84. Minipix Laboratories.

(*Continued from page 89*)



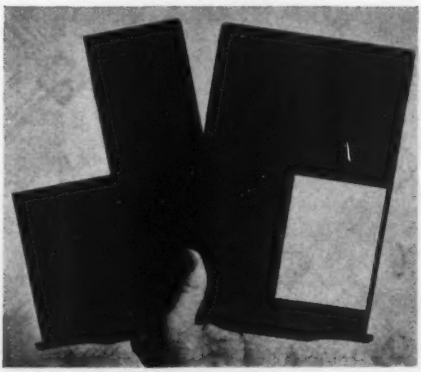
A sheet of white paper for the index is pasted on the outside of the box. The negatives are numbered by making tabs and staggering them for easier location, on the sheets of black packing paper which may be used as spacers.—*H. Klein.*

Cut Film Economy

SEVERAL EXPOSURES may be made on one cut film by making windows in the slide.

In the illustration, openings 2½x3½ were cut in two 5x7 slides, one at the top, the other at the bottom, and a thin strip left along one side to insure proper operation. By turning the two slides over, four different pictures may be made. Other size slides may be cut proportionately.

Remember to insert an uncut slide to protect the film from light, when the holder is not in the camera.—*J. K. Karlovic.*



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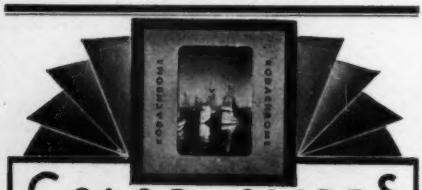
485 Fifth Avenue **New York 17, N. Y.**



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OUT OF THE LAB

tips from a technicians notebook

By RALPH HABURTON

A versatile developer that can be used for either tank or tray development is made as follows:

Hot water	96	ounces
Metol	116	grains
Sodium Sulfite	13¼	ounces
Hydroquinone	290	grains
Kodalk (or Soldium metaborate)	232	grains
Potassium bromide	29	grains
Water to make	one	gallon

This is a pepped-up version of DK-76. Dilute 1-to-1 with water for tank use, giving 12 to 15 minutes at 70° F; or develop about 7 minutes in a tray, using the formula full strength. This same developer has been used as a paper developer by fortifying it with sodium carbonate. In this instance, 8 ounces of the developer was diluted with 24 ounces of water, and a heaping tablespoonful of the carbonate was added. Full development must be given to obtain good print tones.

The step most frequently overlooked in dry-mounting of prints is the preliminary drying of both mount and print. Moist prints have a tendency to buckle and bulge when dry-mounted, so it is better to heat and press the mounts and prints before attempting the job.

The artful dodger has a series of dodging cards prepared in advance so that he can select the right one to fit most any area that will need "printing up" while enlarging. It's a good idea to blacken the edge of the card and the edge of the hole with mat-black. This will reduce the scatter of light and the resultant graying-over of the print.

Approximate conversion factors are handy in direct conversion of metric to avoirdupois formulas. To convert grams-per-liter to ounces-per-quart, divide by 30; to convert grams-per-liter to grains-per-quart, multiply by 15. Frequently both factors will be used in one conversion. To convert a formula calling for 40 grams to the liter, the steps would be:

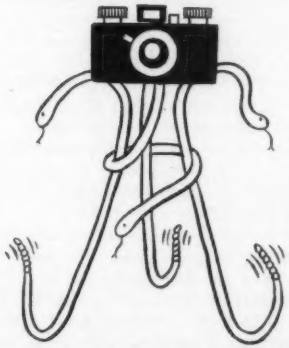
40 grams=30 grams plus 10 grams=1 ounce, 150 grains.

The approximation is close enough for any photographic work.

If you are going to use an electric exposure meter carelessly, you may as well set your camera for a fixed exposure and always use the same setting. The instructions with your meter are important and they should be read and followed. If you always use the "normal" setting you will invariably underexpose the light bright scenes, such as beach and snow scenes, and overexpose uniformly dark scenes. An exposure meter has an eye—but you still have to supply the brain.

You can replace that lost tripod screw with an ordinary quarter-inch stove bolt; the thread is the same. A wing nut provides a grip and gives that finishing touch.

A delayed action shutter release is the best substitute for that forgotten cable release, when making tripod shots. You can't get sharp negatives unless your camera is



steady. Jena glass is no better than Schlitz if you shake the camera when tripping the shutter. A delayed action release may sound like a flock of rattlesnakes, but it will eliminate needless vibration.

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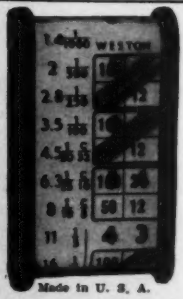

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Calling all Cameras!

By ARTHUR BRACKMAN

IF George Bernard Shaw ever gets around to scanning American photographic journals I am sure he will make the observation that a camera is something to be employed on the same intellectual level as an erector set, and at only slightly greater expense.

He will find on page six of any publication devoted to photographic matters an article on how to dispense with tripods; on page eight he will find a treatise on table-top photography; on page ten an essay on how to improve enlargements, and on page twelve he will read the stirring biography of a lad who climbed to the pinnacle of success by religious adherence to the principle of having each model expose her thigh in the region three inches above the knee at the moment her picture was taken.

Not being G. B. Shaw, I can not be quite as abrupt, but I think it high time that some American sat back on his haunches in the middle of the procession and hollered, "Whoa! Where are we going?"

What is this photographic fanfare about? Why do we take pictures? What is the object of all this photographic writing, manufacturing, advertising, distributions?

If it is chiefly to make and sell amusing gadgets at a profit to those in the business, let's say so. If it is to supply an innoccuous time-killer for bored businessmen and professional men in their leisure hours, a sort of post-graduate Lionel train diversion for bored Babbits, let's put it down in black-and-white.

But if, on the other hand, it's to help create a vigorous national art that springs out of the life of a great, puissant people, an art capable of making a rich contribution to national and world culture and understanding, then, for Pete's sake, let's stop talking about it in terms worthy of ten-year-olds discussing tin scooters.

Who the hell cares if you used a 4.5 lens or a 3.5 lens on that landscape, or whether the exposure was 1/10th of a second or ten minutes? And who cares whether you used coal oil in your developing solution or alcohol, or lamp-black? Is the picture any good, does it have life, freshness, vigor, virility—*does it say something?*

There, I guess, we come to the crux of the matter. Photography—any photography worth even ten minutes of a mature man's time—is

the art of saying something on paper. The writer says his say with words; the photographer says his with image of light and shadow. A piece of writing which fails to say something is worthless.

"But what can a picture say?" a listener may ask. "Isn't it enough if a picture succeeds in registering on paper a visual image that is "pretty."

I should say "No." If men were monkeys, that would be sufficient, because any bright chimpanzee can be trained to aim a camera, click the shutter and, conceivably, to wind the spool. The monkey might produce clear pictures, and the pictures might even be pretty.

You see, I am trying to argue that photography should strive to be at once a medium for enriching culture, which is merely a way of saying it should help make mankind better for having discovered photography.

And if my listener is persistent, and asks again "But what can a picture say?" and "How can a photographer make his picture say it?" I can only tell you that a picture says whatever the photographer is thinking at the moment he snapped it. If he can't think, he should lay his camera in moth-balls until the thoughts and feelings begin to come. Then he should take the camera out and start all over again.

One can tell from just looking at a picture what the photographer has to say, and what he was thinking when he took it.

If the photographer was thinking, "Here is a nifty landscape that ought to knock the eye out of those birds at my camera club and win the blue ribbon at our salon next fall," then that is what the picture will say. It will be an empty, tricky rendition of a rural scene, technically smooth and pretty, but with as little life as a luke warm bottle of Pepsi-Cola. And it will win the camera club blue ribbon.

If the photographer was a professional, engaged in making an illustration for Highwhiff Perfumes, Inc., he was thinking, "Boy, here's the kind of pose Art Director Jones likes; he'll pay five hundred smackers for this baby." He was thinking, "Just one look at this babe will make all the homely mammas trot out to the corner pharmacy for a flash of Highwhiff, because Highwhiff helps them get their man!

Well, that is exactly what the picture is going to say. It is going to be a picture of a vacuous doll, with greedy eyes and sexy legs and it is going to be technically perfect and mentally sterile and it is going to say, "Aren't I lovely," and it is going to sell perfume.

But if the photographer saw a hungry-looking newsboy in front of the Ritz-Carlton Hotel and thought, "That's a shame!"—his picture of the newsboy will say "That's a shame!" to the people who see it. If the photographer saw a fine, clean youth in uniform and thought, "This lad is a symbol of the idealism and courage of the little people who are fighting the

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war!" this is what his picture of that soldier will say.

And if the photographer was a Texan thinking, "Texas looks like Heaven from these sleepy Austin hills," or a rural New-Englander, awestruck before the beauty of a Massachusetts valley, or a New Yorker flushed with pride and wonder at the spectacle of Times Square and he took a picture while thinking it: *these are the things the pictures will say to the people who see them.*

Water seeks its level, apples fall near the tree, photographs say what the taker was thinking, nothing more.

And those of us who write about photography should remember this and stop jabbering about "how-to-do" until we've answered "what".

THE New York City Press Photographers Association Show was a flop, featuring hard, brutal materialism.

The average press photographer, like many news reporters, sees life on the surface only: the violent, spectacular and wacky are his chief pre-occupations.

Good journalistic photography demands more; it demands sensitivity, insight, the ability to portray values deeper than one is apt to recognize in a hectic day of ambulance-chasing.

To me there is something obscene in pictures of bloody bodies at the scene of accidents; I think they have a revolting and brutalizing effect on people. I don't see any reason for them, outside of the fact that they build circulation among impressionable morons.

Newspapers have not, on the whole, stimulated their photographers to go beyond the stage of accident-coverage; newspaper photographers who have developed style and artistry have done so in spite, not because of, their jobs.

Press photography performs an indispensable job; the regrettable thing is that the thousands who see the Radio City show get a cockeyed slant of photography.

Between the hoity-toity cloud-in-the-mist artiness of the salon school and the blood-on-the-pavement school of the press boys there is a swell area to be covered in a photo show. I'd like to see it covered.

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Have you donated your quota of blood plasma to the Red Cross this month? Educational Pictures of New York City has recently completed a short motion picture which shows modern methods of collecting and preserving blood plasma. The Kodachrome, sound movie shows the plasma being frozen and placed in a vacuum where it can remain for as long as five years. But don't wait five years—give yours when it's needed—now!

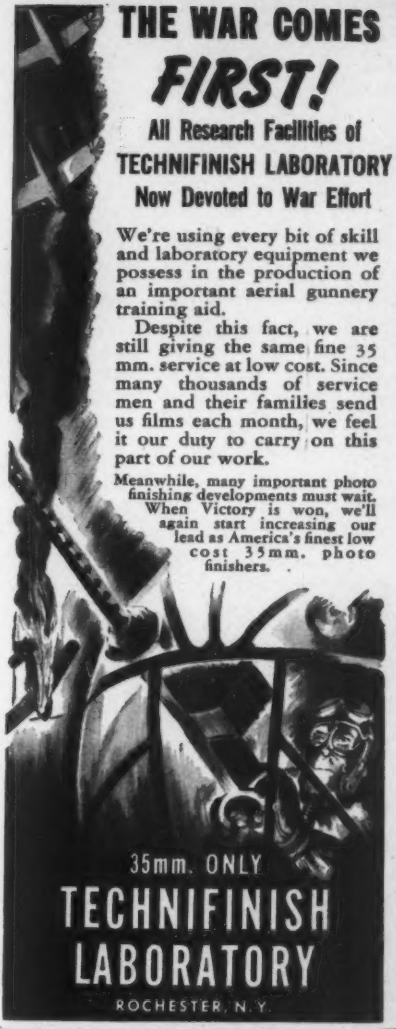
Special Effects

(*Continued from page* 31)

of a certain portion of that mixture will pass through the sieve. It is the same with filters and exposure. Let us use the yellow filter and blue sky again as an example. Some blue light passes through the average yellow filter. If a short exposure is given, less blue will have an opportunity to pass through; long exposures will enable more blue to go through the filter. With a single yellow filter, therefore, the shorter the exposure, the darker the sky will be reproduced. There are limitations; the exposures can't be too short so that the rest of the scene is badly under-exposed.

Since a filter holds back a portion of light, the net result is that less light reaches the film than if the filter is not used. This necessitates an increased exposure, the amount of increase being termed the *filter factor*. Manufacturers provide tables indicating the factors for various filters with different films.

A closing point to remember, especially in the case of skies, is that a filter should be used only if there is something to filter. When a sky is completely overcast and grey, containing no blue, a filter is of no help. If there is very little blue, you would want to use a dark yellow, orange or red filter to obtain the maximum effect so that the sky will reproduce in a definite tone.



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(*Continued from page* 17)

ments might be, the question of purpose and aesthetics in one's work will, in the future, remain with the individual, as it has been in the past.

In photographing people, their home life, manner of worship and customs it is obvious that cooperation and good will toward the photographer is of paramount importance. As a rule our small national groups resent being made a subject of photographic studies. And you can't well blame them for it. It was a practice for many years for sensation-seeking editors to accept photographs of less-known national groups of a type that would degrade the self esteem and pride that all people equally possess. These photographs more often than not would portray such groups as weird characters and their customs queer and ridiculous.

Devoting my time and energies in using the camera for the purpose of promoting unity and better understanding among Americans of many national racial and religious origins, I naturally am serious enough to give truthful interpretation of my subjects. And above all, I like them, so how could I do otherwise. I am fascinated by the beautiful mosaic of cultures that were brought here to weave a new one while preserving some of the old.

I believe better understanding of our people will lead to the gradual disappearance of intolerance, antagonisms and segregation because of one's color, creed or nationality. This will lead to a stronger foundation upon which an idea of democracy may live in the hearts and brains of all. With this approach I find no difficulties in coming close to the lives of other people and have them accept me as an equal. So in reality it is only my belief in democracy, and theirs, which is my approach.

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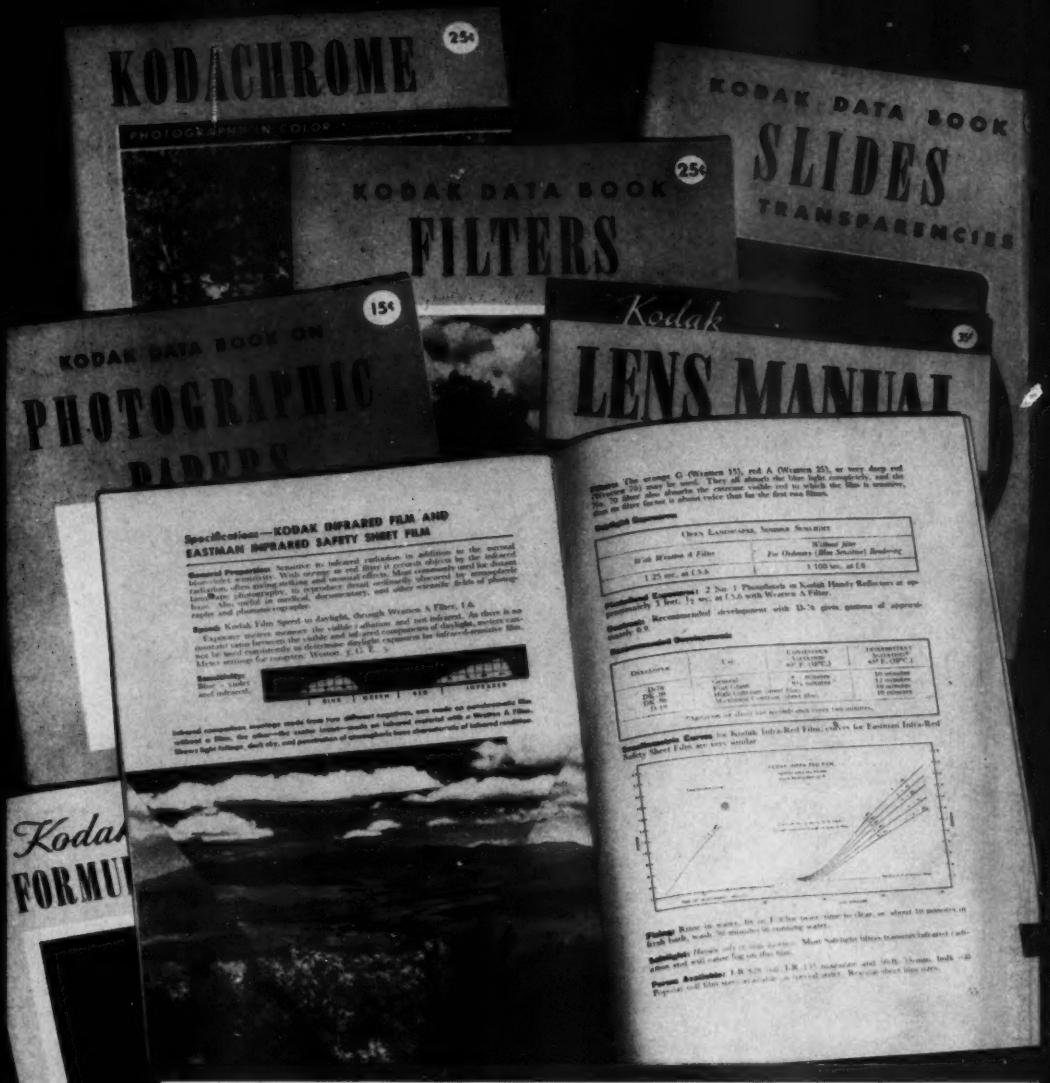

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